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ABSTRACT

In October 1989, St. Petersburg Junior College and the American Association of Community and Junior Colleges sponsored a seminar on strategies that community and junior colleges can use in working with business and industry to meet America's future work force needs. The proceedings of the seminar contains the text of presentations by nine speakers, offering the perspectives of business, education, and government. The proceedings begin with Carl M. Kuttler's introductory comments about the event, followed by Dale Parnell's remarks concerning the challenges and opportunities facing colleges and universities in the future, and Gerald R. Ford's observations about the changing international climate and its affect on the role of community colleges. Next, Lawrence H. Williford discusses the current socioeconomic trends shaping education, the economy, and the work force in the year 2000. Bernard R. Gifford's talk focuses on the transition from the industrial age to the information age, reviewing the characteristics of each and their implications for education. Next, Dagnija D. Lacis challenges community colleges to prepare a work force that has basic reading, writing, and math skills; that is comfortable with common computer applications; and that is culturally literate. Chester E. Finn, Jr., reviews disheartening findings from the National Assessment of Educational Progress, compares the expectations of American and Japanese education, and highlights educational reform efforts worldwide. Next, Forrest P. Chisman discusses ways that businesses and community colleges can help solve the work force literacy problem. Richard F. Schubert discusses a report on "Investing in People--The Strategy to Address America's Work Force Crisis." Brief descriptions of community college work force development programs are presented throughout the proceedings. (DJD)

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1989 LEADERSHIP SEMINAR:

WORKFORCE 2000

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Gerald R. Ford Museum
Grand Rapids, Michigan

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Carl M. Kuttler, Jr., is an alumnus of St. Petersburg Junior College of which he is now president. He has served at SPJC for more than 23 years. The institution has been cited for initiatives in excellence at ceremonies at the White House, the Florida Legislature and before the Florida State Board of Education. He was a presenter before the National Commission on Excellence in Education, the publisher of ***A Nation at Risk****. In December 1988, he was appointed by the president of the United States to the National Advisory Council on Educational Research and Improvement. Dr. Kuttler has received an award from the AACJC for his creation of the Presidential Library Leadership Seminars, of which* ***Workforce 2000*** *is the second. He holds a doctorate of law from Stetson University.*

Foreword

On October 26-27, 1989, **WORKFORCE 2000**, the second annual Leadership Seminar, was held at the Gerald R. Ford Museum, sponsored by the American Association of Community and Junior Colleges and St. Petersburg Junior College. The goal of this seminar was to share strategies on how community and junior colleges can work with business and industry to meet America's future needs in the work force. From the presentations, interactions and panel debates, we hope that you have been inspired to return to your campus and community with a renewed sense of urgency in this important challenge.

Larry Williford, senior vice president of corporate relations at Allstate Insurance Company, captured the theme of the seminar: "When you consider that the quality of education affects not only the quality of the work force, but the quality of life itself for every individual in the country, then a little brainstorming and barnstorming in pursuit of a better way seems like a good idea."

We were honored to have former President Gerald R. Ford, who has spent a lifetime in public service, lead our seminar. President Ford, as minority leader in the House of Representatives, was instrumental in including junior and community colleges in the Higher Education Act of 1965. He knows our work in producing students for the work force is critical to the future of America. Along with President Jimmy Carter, President Ford was honorary chairman of *A Third of a Nation*, a report detailing the prospects of a national underclass — deprived, disadvantaged, ill-trained and undereducated. He challenged us to continue our work and to increase our commitment in this vital area.

This seminar has inspired us at St. Petersburg Junior College. We plan to develop stronger minority action plans and to implement a model college within our college based on valued educational principles from around the world. We want to work more actively in the field of adult literacy. But most importantly, we at SPJC, like you at your colleges, are inspired to step out and join with partners in industry and business. We must ask what they need and work with them to fill those needs. Then, our colleges will be the colleges that our dreamers thought they could be and our risk-taking governing boards want them to be.

Community and junior colleges can be the leaders in preparing America to meet the challenges of the future and in regaining the competitive edge. I trust this seminar was inspiration for us to help create an internationally competitive work force for the 21st century.

--Carl M. Kuttler, Jr., President
St. Petersburg Junior College

Dale Parnell is president and chief executive officer of the American Association of Community and Junior Colleges and a visiting professor at a number of universities. He served as first chancellor of the San Diego Community College System and president of the San Joaquin Delta College in California, and prior to that was superintendent of public instruciton for the State of Oregon. He was the founding president of Lane Community College in Oregon. Dr. Parnell is the recipient of numerous national, state and local awards. He is a board member of the Carnegie Foundation for the Advancement of Teaching and of the U.S. Dept. of Labor 's Commission on Workforce Competencies. He is the author of ***The Neglected Majority, Competency Based Education and Dateline 2000: The New Higher Education Agenda.***

Introduction

The future of higher education will be largely based upon overarching forces that are, by and large, external to colleges and universities of all types and sizes. The link, for example, between the economy, education and human resource development is solid and becoming more important every day. It is an umbrella external force that will impact all education institutions regardless of their mission.

It is with this impact in mind that AACJC and St. Petersburg Junior College sponsored this leadership seminar on America's future work force. It is also with this external impact on education in mind that former President Gerald Ford and influential business leaders accepted our invitation to share with you their forecasts for the future of the work force.

The 1990s could well be the most important decade of human history. It is the end of a century, the end of millennium and the end of many aspects of our current way of life. But it is also a beginning. The '90s will introduce us to the new age of technology, the new learning age, and it will bring rich possibilities as well as challenges for colleges and universities.

Being from farm country in Oregon, I like to say that in my lifetime I have gone from cow chips to potato chips, to computer chips, to nanochips. So, too, in these past 50 years has the United States. We have had a major war, where we introduced the atomic bomb to the world, and two other wars of considerable magnitude and pathos. We have experienced turbulence on the college campus, a social revolution in mores, a civil rights struggle, antitax revolts, and a flood of new individuals, particularly females, into the labor force and into higher education. We can now travel faster than the speed of sound, including travel into space, and experience instantaneous visual communication around the world.. We have become a global community in terms of trade, travel and telecommunications. The computer is revolutionizing the publishing industry, the defense industry, the financial world, health sciences and basic manufacturing.

Who would have forecast these developments 50 years ago, or even two or three decades ago? But the astonishing fact is that our country has experienced all of this in real-life living color and our system has not collapsed. Our political, economic, and educational institutions have a certain resiliency to be able to bounce back from trouble and adversity.

When one weighs the evidence on all sides, it appears that the Unitd States is on the edge of a major period of economic growth and technological expansion, which will be fueled by education.

In 1952 Calvin Coolidge said, "The business of America is business."

Today, Austin Kiplinger states in his book *The New American Boom*: "The business of America is EDUCATION. Education constructs the foundation of technology, and technology in turn provides the track for industry and commerce to advance

into the 21st century."

The 1990s will be a decade of challenges, but promises to be a boom period for higher education. The road to the year 2000 will not be free of potholes and regional problems, but scientists, engineers and business leaders are predicting that an education-based technological boom is on the way that will take off in the 1990s in a steep upward curve.

This new higher education boom will happen in an environment of automation and increased productivity; slow population growth; higher wages for a more experienced, older and better prepared work force; better education-training and more opportunity for the unskilled workers; more and better research and new and improved procedures for technology transfer to the marketplace.

The decade of the 1990s will present community, technical and junior colleges with rich new possibilities and opportunities as well as some challenges. Higher education leaders who can recognize and take advantage of the external windows of opportunity and solve some of the internal operating problems will be the leaders required for the year 2000.

How colleges respond to the forces of change in the decade ahead will depend in large part on their leaders being good managers. Those colleges that thrive in this turbulent atmosphere will be led by leaders who know and implement exemplary leadership practices.

--Adapted from Dr. Parnell's book *Dateline 2000: The New Higher Education Agenda*

Dale Parnell
President and Chief Executive Officer
American Association of Community and Junior Colleges

Gerald R. Ford

38th President of the United States

Gerald R. Ford served as the 38th president of the United States from August 1974 to January 1977. Prior to his succession to the presidency, he became vice president in 1972. He served from Michigan in the United States House of Representatives from 1948 until becoming vice president. He was chosen minority leader of the House in 1965 and served as permanent chairman of the 1968 and 1972 Republican National conventions. Mr. Ford practiced law both before and after serving as an officer in the United States Navy during World War II. He is author of ***A Time to Heal****. A recipient of many awards and honorary degrees, Mr. Ford holds earned degrees from the University of Michigan and Yale Law School.*

It's a very high honor and a great privilege for me to welcome you all to God's country, the old Fifth Congressional District in the great state of Michigan. More often than not recently, since I lost my job in Washington and since my wife Betty has been so active and effective out at the Betty Ford Center, I've been introduced as Betty Ford's husband. Of course, I'm very proud of her personal achievements and success in the field of alcoholism and chemical dependency.

Coming to a conference of this sort is always a special pleasure when I have an opportunity to see some old friends. Former Congressman Bill Cramer came to the Congress while I was in the House. We became very close and long-standing personal friends. He was an outstanding member of the committee on the judiciary, and, Bill, it's nice to have you here and a part of this group.

I'm also pleased to see Dr. Paul McCracken. He is one of the outstanding professors at the University of Michigan's Business School in the Economics Department. At a very crucial time, Paul McCracken was Chairman on the Council of Economic Advisors and was extremely helpful not only to the President but to all of us who were serving in the Congress at the time and needed good counsel and assistance on some of those challenges that we faced. Paul, it's nice to have you over here.

The Grand Rapids Junior College was started the year I was born, 1913. It's had a very long and illustrious career and has contributed significantly to the fine educational opportunities here in this western Michigan area. The contributions of JC (as we used to call it) go back to an outstanding president, who one or more of you may remember. President Andrews had a tremendous impact not only on JC but on education generally in this part of the state.

I share Mr. Larry Williford's very strong observation that in the next 10 years the possibilities or probabilities for peace are much higher than they have been over the last 25 to 40 years. The developments between the super powers, the United States and the Soviet Union, are encouraging, and I, for one, hope very strongly that Mr. Gorbachev is successful with *glasnost* and *perestroika*. I don't envy his challenges, however. He has publicly stated that Marxist communist economic policy is a total failure. He has very succinctly recognized that that economic system, tightly controlled and dominated by government, cannot feed and cannot clothe its people. It is also a recognition that that kind of economic policy will not compete with the Western market-oriented economy such as in the Pacific Basin or in Europe.

The problem Mr. Gorbachev has is whether he can succeed in changing a failed economic system quickly enough to one that has a chance for success so that the legitimate needs and desires of the Russian people can be met. Many very wise and knowledgeable leaders in Western Europe who hope he'll be successful do not give him any better than a 50/50 chance. Some give him less odds than that. That's a tough challenge. So even though we think we have difficult problems on our doorstep, and we do — and Mr. Williford outlined a number of them — I like our challenges better than those that he (Gorbachev) faces in Moscow.

The question was raised by Mr. Williford, "What is the potential impact if we have

a negotiated agreement between Mr. Gorbachev and President Bush on strategic arms and conventional military forces?" I believe that there will be negotiations completed by these two leaders sometime next year which will result in planned phasing down of strategic weapons as well as conventional arms.

Those developments, however, will not overnight bring about a significant reduction in the expenditure for national security. It will take a little time, and, therefore, I hope and trust that we're realistic about what we think we can divert from the Defense Department to the other basic needs which are overwhelming in this country. It can result in reductions in expenditures from the Army, Navy, Air Force and Marines, but it will not happen overnight. Nevertheless, we should plan for these changes as they are going to materialize.

I was in Congress at the time the higher education bill was passed. I believe it was 1965. I had just become minority leader in a somewhat controversial election by the landslide margin of 73 to 67 so we had some new challenges not only within my party, but in the Congress. But that legislation, I can say from very practical experience, was not one that was totally embraced by all elements of the higher education community. The four-year colleges resented the intrusion of the junior and community colleges, and it was only through a very well-organized and effective lobby that the junior and community college portion was actually included and eventually funded.

You (community colleges) are important and critical and do the kind of a job that is absolutely important to our economic system and our work force in the year 2000.

You were not included because your counterparts at the four-year colleges were for it. It was because you made a good case, and the facts are the two-year college programs have been a tremendous addition to our educational system throughout the country. What you do in the way of producing students for the work force is critical, and I hope and trust that you are going to emphasize those things that you do far, far better than anybody else. I don't think you should abandon what you do so well and seek to necessarily get into another area or category. You are important and critical and do the kind of a job that is absolutely important to our economic system and our work force in the year 2000.

I think none of those issues we have discussed on other occasions are more timely and compelling than equipping Americans for competitiveness in a global economy.

A year ago, this month, as a matter of fact, some of you might well have been present in Atlanta at the first of these Presidential Leadership Seminars. My very good friend and former adversary, former President Jimmy Carter, said at that time if the community college leaders do not meet the challenge of educating an internationally competitive work force, who would? That is, very succinctly, what your challenge is both as educators and as members of the business community. President Carter and I have collaborated on a number of issues. He has come to my library and museum in Michigan, and I have been to his in Atlanta. I think none of those issues we have discussed on other occasions are more timely and compelling than equipping Americans for competitiveness in a global economy.

In 1988 the Gallup poll, and some other recent public opinion surveys throughout the country, reported that Americans are fearful about the nation's economic future, some are fearful of stock market collapses, others fear foreign takeover of American assets, others fear for that most common of reasons — lack of understanding — and others, I suspect, wonder if our next generation of leadership will rise to the international challenges of the next century.

That kind of fear, which I don't think is justified, can paralyze America.

The American community colleges can be the catalyst for bringing education and businsess together in the solution of this challenge.

Let me join the ranks of those who are bullish about America's future. I read the litany of statistics that come out of the nation's capitol — most of them are good;

some of them are bad. But when you look at the total, I feel good about America, and I feel encouraged about our country's future.

Of course, we cannot enjoy full employment without fully employable citizens — educated, trained, and informed of the realities of their places in a very tough and competitive global economy. That's why President Carter and I were pleased to be honorary chairmen of the report, which many of you may have read entitled, *A Third of a Nation*. It presents, as I think we should, the prospects of a national underclass — deprived, disadvantaged, ill-trained and undereducated. Now in the 21st century this could be America's "Achilles Heel."

I don't accept that as a foregone conclusion. I accept it as a challenge, an opportunity, and all of you in this room, in your respective capacities, have an opportunity to make that opportunity into reality.

The American community colleges can be the catalyst for bringing education and business together in the solution of this challenge.

Schoolcraft College, Livonia, Michigan

Schoolcraft College and the Detroit Public Schools have developed two partnership programs designed to encourage minority students to stay in school, develop career goals and attend college after graduation from high school.

The first program is a Tech-Prep program developed around our flagship program in culinary arts. This program received support from AACJC through funds provided by the Sears Foundation. The program began with meetings between community college and public school representatives to determine the curriculum and identify students who would participate. Students' academic skills were assessed and food service training was provided by the school. Students who enter the community college program are guaranteed a job upon completion, which encourages them to complete the degree.

The program begins with a summer orientation class which helps students become familiar with the college and develop peer relationships. As they begin the program, they are given assistance in study skills. Students, in their evaluation of the program, have given high marks to tutoring, financial assistance and teachers' support, that includes a belief in them which helps them believe in themselves.

The second program is the Schoolcraft Engineering Enhancement Program. It was established to give middle-school students an opportunity to be on a college campus, have special learning experiences and have fun. A college board member and staff provided the leadership in working with the Detroit Area Pre-College Engineering Program and the Detroit Public Schools to identify 30 minority students who had completed eighth grade.

The students and their parents were hosted at an orientation program. During the next four weeks, students were transported to and from the campus in school buses. They studied computers, math, communication skills and engineering principles, including robotics, lasers and superconductivity. They were also provided lunch and the opportunity to swim in the college pool. They went on a field trip to the Ford Motor Company test track and had a discussion with a panel of Black college students and professional engineers who provided insight into college and the working world.

The parents, teachers and friends attended a graduation ceremony where the students were awarded a certificate and provided the opportunity to share the significance of this unique experience. The testimonials were very positive and quite emotional. The students indicated that this experience reinforced their desires to apply themselves to do well in school and attend college upon graduation. It is our hope that some of them find their way back to Schoolcraft College.

—Richard W. McDowell, President

Lawrence H. Williford

Senior Vice President Corporate Relations, Allstate Insurance Company

Lawrence W. Williford is senior vice president of corporate relations, Allstate Insurance Company, and is a member of the Allstate Board of Directors. He began his career with Allstate in 1960 as a public affairs manager and has held many management positions since that time. He was elected to the vice presidency of corporate relations in 1975 and to his current position in 1988. Mr. Williford is a trustee of the National College of Education in Evanston, Illinois. He is also active in the Foundation of American Communications, the Goodman Theatre and the National Safety Council. He currently serves as vice chairman of the National Commission against Drunk Driving. Mr. Williford holds a degree in business administration from Northwestern University.

I have been asked to kick off our discussion by giving an overview on the subject of the work force in 2000. In one sense, being asked to project trends and ideas a decade ahead makes me a little nervous. As any psychic or sportswriter can tell you, predicting is a pretty risky business. But it's in our human nature to try. And it's also necessary — unless we predict, we cannot plan. And unless we plan, we cannot progress.

So what can we expect come the millennium? In what kind of world will we live and work? How will companies and countries gain competitive advantages? What issues must our institutions, corporations and community colleges confront if we want to help ourselves and our society succeed? I obviously don't have all the answers. I may not even raise all the right questions. But let me highlight three important trends in each of two categories. Trends in the world at large and trends in the world of work. Taken together, these ongoing developments should have a major impact on the way Americans learn, and earn, in the year 2000.

■ Let's begin with trends in the world at large — the geopolitical environment in which we compete, both economically and ideologically. Trend number one suggests that 10 years from now the world could be a significantly more peaceful place. That may sound strange since this has been the bloodiest century in the history of mankind. But consider which way the winds are blowing lately — in Eastern Europe, in Angola and Afghanistan, in Central America, maybe even in the Middle East.

I'm not saying man will overcome his militaristic tendencies in the next 10 years. Wars of some kind, somewhere, will always be with us — after all, more than 17 million people have died in armed conflicts since peace supposedly broke out in 1945. What's different today is that the big boys aren't egging each other on. The superpowers seem willing to not only accept, but perhaps even accommodate, each other. Will it last? At the beginning of this decade, no one would have predicted *perestroika* and *glasnost*. Few had even heard of a guy named Gorbachev. The tables could turn again. The cold war could heat up. But the tide is running strong in the right direction, for a couple of reasons. First, because freedom is a funny thing — it's hard to put the cap back on once you've taken it off. Poland and East Germany are good examples. Secondly, the trend is motivated by economic factors that are inescapable. Communism isn't working. Even in western socialist systems like France, the move is toward more capitalism and less government control. Free enterprise is on the ascendancy everywhere.

In fact, many people believe that economics is replacing armed conflict as the primary means of competition between nations. Look at Japan. It has become a world power without firing a shot. While Russia, despite its huge military machine, has slipped. And the United States? Some say we're making headway in the fight to regain ground lost over the past generation. While others, like *Time* magazine, believe a lack of leadership is "letting America slip into paralysis." Time will tell, I suppose. But how do these developments directly affect our work as executives and educators?

Freer economies are clearly better for business. At the same time, the reduced threat of war could let Russia and America make what Gorbachev calls a "transition from the economy of armaments to an economy of disarmament." Less money for missiles and

more to help repair our social infrastructure.

How would we use the extra funds? In a survey conducted earlier this year, Americans were asked to rank their priorities for government spending. Defense finished fifth on that list. What came first? Education.

By the year 2000, creativity will be the most important commodity any company or country, or individual for that matter, can have.

■ The second major trend in the world at large is related to the first because over the next decade many people believe we will see the emergence of a true global marketplace. In Detroit, they'd say that globalization has been with us for a long time now. And it's true. Over the past 30 years, for example, the percent of our GNP based on imports and exports has more than doubled, but the experts believe we "ain't seen nothin' yet."

Advances in communications and transportation, the lowering of European trade barriers scheduled for 1992, emerging economies in the Pacific Rim and elsewhere — all of these developments support a worldwide, freer trade scenario in the year 2000. Trends could change; politics could come into play; wars could get in the way. But a lot of world economies have bet their futures on the internationalization of business. They'll work hard to make sure those plans become reality.

And again, this trend has implications for both business and education. When standards for quality and price and profits are set on a global scale, companies must be prepared to beat the best the world has to offer — even if they're not selling internationally themselves.

Schools must be prepared to produce workers willing and able to thrive in such a world. When more than half adult Americans can't find England or France on a map and the average American MBA knows as much math as the average eighth grader in Japan, we're not yet ready to prosper in the coming international economy.

■ The third trend I wanted to highlight in the world is this — by the year 2000, creativity will be the most important commodity any company or country, or individual for that matter, can have. The 21st century will be the age of ideas in business. Already, most of the old imperatives have gone by the boards. Is land still critical to becoming an economic superpower? Hardly. Compare Brazil and Japan. Is capital? It seems like you can get money anywhere these days. Raw materials? They're less and less important, too. Look at the silicon chip — its basic ingredient is sand, literally cheaper than dirt. But look at that silicon chip a little closer. It has an enormous value not because of what it is but because of what it does. It carries ideas and information.

We've already seen this trend in action. More than half of all jobs now reside within the so-called "information sector" of the economy. This trend will affect the planning process for both executives and educators. In business, we're going to have to promote innovation and entrepreneurship on a scale unimagined 10 years ago. It will affect everything from how we design our offices to how we compensate our employees. At the same time schools are going to have to teach more than basic facts. They're going to have to promote creativity and originality and the importance of lifelong learning.

So, those are three trends in the world at large that strategic planners at companies like Allstate are factoring into their scenarios for the year 2000. Whether they're right, of course, remains to be seen.

What about the world of work trends I mentioned? More specifically, trends affecting work in the United States in the year 2000? Here the picture may be clearer. At least, if you believe in the theory that demographics is destiny. Three clear-cut socioeconomic trends should dominate the world of work in the year 2000.

■ First is an unmistakable labor shortage that is already affecting many businesses and will become worse by the end of the next decade. The reasons behind the shortage are well known. The population is growing more slowly than at any time since the Depression years — less than half as fast, for instance, as during the 1950s. That, in turn, means the population is also getting older. Over the next decade, the over-65 population will grow by 20 percent while the under-35 group will shrink by 14 percent. Taken together, those two trends mean that by the year 2000 the work force will be growing at a rate less than 1 percent per year while economists expect the GNP to be growing at something like 3 percent annually. Obviously, those two numbers don't add up.

Now, companies like Allstate are already developing plans to deal with the labor shortage and its implications. We've implemented recruitment programs that include videos, brochures, even contests — all designed to help us attract more and better students at the start of their careers. We simply can't afford to lose the competition for top prospects within a shrinking labor pool.

The same business-type problem affects higher edu-

cation. When the supply of raw material, in this case students, is suddenly reduced, plans have to be altered and strategies redesigned. One thing that may help higher education cope is the need for higher levels of learning within the work force a decade from now. For example, the percentage of jobs requiring a high school education or less will drop while the percentage demanding one to three years of college will increase from 20 percent to 22 percent, and the number requiring a college degree will increase from 22 percent to 30 percent.

What's more, the need for supplemental training and retraining of current workers will increase greatly. Between 1985 and 1995, American business will spend $150 billion to $200 billion on industrial automation and the resulting productivity increases will cost 15 to 20 million employees their jobs.

What we're entering, many experts feel, is a 30- to 40-year period during which the economy's single biggest need will be retraining for new and displaced workers. In fact, retraining several times in one's career is likely to be a fact of life by the year 2000. This is a challenge and an opportunity for community colleges, and an area where business and higher education can clearly help each other through cooperation.

■ The second demographic trend I'd like to highlight is related to the first. Along with a labor shortage, we're facing an education shortage in America. It's caused in part by the dropout plague. Almost 30 percent of America's high school freshmen quit before they get their diplomas. In many urban centers, the dropout rate reaches 50 percent or 60 percent. But it's also the result of inadequate preparation for those who do stay. Most of us are familiar with the litany of statistics. Studies say as many as one-fourth of our high school graduates are not "functionally literate." In one survey, most young adults couldn't summarize a newspaper article, read a bus schedule or figure their change from a restaurant bill.

Higher education apparently hasn't done much better. A recent survey of college seniors showed that one-fourth of them couldn't say when Columbus sailed the ocean blue. The same percentage thought Karl Marx's basic tool of communism — "From each according to his ability, to each according to his need" — was actually part of the U.S. *Constitution*. Only one-fourth knew that Dostoevsky wrote *Crime and Punishment*.

There is no need to belabor the point. What the education shortage means to business, according to the U.S. Department of Labor's report *Investing in People*, is that "alarming numbers of young job applicants have such poor reading and computation skills that it is impossible to provide them with job-specific training."

And remember, we're talking about basic skills, not the more complex, creative kinds of abilities that will be in greater demand by the year 2000. No wonder companies are already spending more than $30 billion a year on worker training — an amount that is sure to increase. Add it all up, and the first two trends suggest a serious shortage in both the quantity and quality of entry-level applicants for colleges and companies in the year 2000.

■ Then, into this equation we can factor the third major demographic trend of the coming decade — the increasing ethnic diversity of the student and employee population in America. During the '80s, immigration accounted for a fifth of America's total population growth. During the '90s, America's black population is expected to increase nearly twice as fast, and the Hispanic population more than four times as fast, as whites.

What that means, as President Ford pointed out in the report of the Commission on Minority Participation in Education and American Life, which he co-chaired with former President Carter, is that, "At the dawning of the 21st century one out of three American school children will be members of minority groups. We must educate and train them to meet the demands of an increasingly competitive international marketplace. The future of democracy depends on it."

In addition to increasing ethnic diversity, the number of working women in America continues its 20-year climb. In 1970, 39 percent of school-age children had mothers in the work force. Today, it's 60 percent.

Put the two developments together, and you realize more than eight out of every 10 new employees entering the work force during the '90s will be minorities and women. Already, white males are a minority in the work place — representing 45 percent of all U.S. employees. By the year 2000, that share will be down to 39 percent.

Companies, like Allstate, are already developing strategies to capitalize on this important trend. We are convinced that if we can do a better job of managing diversity, we can create a tremendous competitive advantage that will last through the '90s and beyond. Companies that manage diversity well should be able to hire better people who are more productive. They should be able to make better decisions since they'll be getting better input from a cross-section of employees. They should be better marketers as well because diversity in the work force will reflect diversity in the population.

Obviously, there is a lot of work to be done in this

area. Today, too many minority employees work in low-growth, low-pay job categories. The report of President Ford's commission includes many proposals to help overcome those obstacles. One important way companies can help is by throwing out the old "melting pot" idea, where the emphasis was on helping minorities fit into an already existing homogeneous culture. Instead, we should work toward corporate cultures that are truly heterogeneous — where people are neither advantaged, nor disadvantaged, because of their backgrounds and where workers are encouraged to make the best possible use of their different talents.

One final thought about socioeconomic trends that may have a major impact on education and the economy in the year 2000. It's difficult to tell at this point what role America's drug epidemic should play in our planning for the year 2000. On the one hand, there are signs of hope. In Ann Arbor, the University of Michigan's Institute for Social Research reports that over the past two years cocaine consumption among young adults actually showed a significant decline. Meanwhile, next door in Detroit, a recent report showed that more than 40 percent of the babies born in an inner-city hospital were exposed to drugs while still in their mothers' wombs.

We know that such exposure creates all kinds of long-term physical and learning problems for children. As the head of the Michigan Department of Public Health said, "These babies have lost the battle before they were even born." It's hard to know exactly where this trend will take us over the next decade. But there is no doubt that drugs will continue to affect our ability to educate and employ Americans, particularly young people, in the year 2000. So those are some of the trends in the world at large — and in the world of work — that may have a major effect on the work force in 2000.

I hope I've made the point that these developments influence both our professions. Take the question of diversity. Both our institutions face the need to maintain high standards while accommodating different styles. Or the need for innovation. How can we promote greater entrepreneurship? How do we balance creativity and conformity? How do we reward revolutionary thinking while still exercising control and maintaining quality?

Because our institutions are similarly structured and face similar challenges, there's no doubt we must work together and learn from each other. That was certainly the premise behind several days of meetings and several weeks of work by representatives from corporate America who attended Allstate's Forum on "Laborforce 2000" earlier this year.

It was probably the largest national gathering to date of business people concerned with the issue of education. And while the Forum focused its attention largely on grades K-12, I believe its ideas are also of importance to this audience for two reasons. First, community colleges enroll more than half of America's freshmen each year. If the primary and secondary systems are breaking down, the effects are being felt first and most dramatically in your institutions. Second, colleges can and should do more to help school systems overcome their current limitations. You can serve as an important resource, a laboratory, an inspiration. You can make a difference.

The challenges we face in education and the economy in the year 2000 can be met if we as a society are willing to act in unison and insist on excellence.

So can business. Our Forum report outlines dozens of ways in which companies can have a positive impact on the educational environment in their own communities. As the report notes, business shouldn't try to act alone. Education reform on the local level can only be effective if it includes all the major constituencies within a community. But there's no reason why corporations can't take the lead in such efforts — serving as catalysts to get the process started.

I started out by saying predicting is a pretty risky business. But it can also be extremely helpful. If the issues we've highlighted include problems as well as opportunities, and they do, then looking a decade ahead gives us a 10-year window of opportunity in which to do something about them.

Ten years in which to minimize the problems and maximize the opportunities for everyone in our society. And to those who say 10 years isn't nearly long enough, I remind them that the pace of change today is faster than ever. When this decade began, IBM had yet to market its first personal computer. An entire industry has been born, developed and matured in these past 10 years.

Today, more than ever, change can occur quickly. The challenges we face in education and the economy in the year 2000 can be met if we as a society are willing to act in unison and insist on excellence.

Anything less will be less than effective. And less than America deserves.

Bernard R. Gifford

Vice President for Education, Apple Computer, Inc.

Bernard R. Gifford is vice president for education for Apple Computer. He has served as dean and chancellor's professor of the Graduate School of Education, University of California at Berkeley; as a deputy chancellor of the New York City Public School System; and as resident scholar at the Russell Sage Foundation. Most recently, he served as chairman of the National Commission on Testing and Public Policy, which published its report, "From Gatekeeper to Gateway: Transforming Testing in America." He is widely published in areas ranging from physics to public policy and has recently centered his attention on the process of educational change and reform. His latest books, published since 1988, relate to a variety of educational topics. His doctorate is from the University of Rochester.

One of the things that I did when I was at the University of California at Berkeley was to reinstitute one of Berkeley's very strong suits — a doctoral program in higher education administration, which many of you know, has been responsible for training a large percentage of community college presidents in California and in the West. It was a program that T. K. McConnell led and Metzer and Dale Tillery were involved in. It was my distinct honor and pleasure as dean to recruit Pat Cross from Harvard University to come to Berkeley and to head up that program, which is going full steam ahead. I want you to know that as you move on, a new generation of Berkeley grads is coming to fill your shoes.

A transition is taking place in our society. It's a transition from not simply the industrial society to the post-industrial society, as Daniel Bell described it almost 20 years ago, but it is a transition from the Industrial Age to what I call the information age.

This transition is probably one of the most important events taking place in this century. In many ways it is equivalent to the transition in our economy which took place approximately 100 years ago from an agricultural age, a period during which close to 50 percent of America's work force was employed in the business of gathering food, to a situation where the number of agricultural workers declined precipitously and the number of people involved in manufacturing increased at a tremendous rate. We're at one of those periods in our history when, in fact, the percentage of people involved in manufacturing is declining at an extremely rapid rate, and the number of people involved in non-manufacturing jobs is increasing at a very rapid rate.

What made the Industrial Age possible were a number of elements.

- First of all was the availability of low-cost labor. As people left the farms and looked for new opportunities, they crowded into cities and made available to those attempting to build mass energies a plentiful supply of low-cost labor.
- Other ingredients went into the creation of the industrial society, and one of the more important elements was the availability of low-cost energy due to abundant natural resources. That certainly was the case here in the Midwest.
- There were other advantages. America was becoming strong. There was a distinct global economic pyramid with the United States and the United Kingdom and one or two other countries in Western Europe clearly at the top.
- And last, but not least, all of these elements came together at a time when new forms of organization were being developed by organizational geniuses.

It is interesting that when we look back upon the establishment of the industrial society and think about the heroes of that age, we don't think in terms of great scientists. Many people think of Thomas Edison. But, Wheatly and others helped to invent organizational forms that would bring together all of these elements and create efficient and effective master organizations. It was really the organizational genius, with the ability to invent new organizations, who made the industrial society possible.

But, of course, while the industrial society created enormous economic opportunities, its organizational form did have weaknesses. One of the primary weaknesses, frankly, was the way in which information flowed in these master organizations — and

that is the inclination of the flow from the top. Decisions were made at the top of an organization, and essentially people in the lower part of the organization were informed of that decision and then proceeded to make decisions based on the information handed down to them. Information was not a democratic resource — information was pretty much a monopoly of those at the top of the organization.

But we are in the process of a tremendous transformation. The industrial society is no longer a model that's going to continue to generate great wealth to this country because all of the resources that go into making up an industrial society are now available to other countries. Those other countries are now growing at a rate far greater than us and are building new models of an industrial society. And so, the real issue is what kind of fluid economy are we going to have to build in order to continue to provide large numbers of middle-income producing jobs for all Americans?

There are those, and I put myself in that camp, who argue that if we're going to make this transition successful, we must understand that we are in the middle of the creation of the information age. The most important resource in the information age is the micro-processor, which is nothing more than a tool that enables us to utilize information as an economic resource.

Before I went into corporate America, I did a lot of reading and thinking about the importance of information. But it was only when I joined Apple that I realized that there was some substance behind the arguments that I had read and many of the arguments that I had conveyed in my own writings.

Apple is a global corporation. We have research labs in Paris; in Tokyo; in, I think, Cambridge, Massachusetts; and in Cupertino, California. We have manufacturing facilities in Hong Kong, in Singapore and in the United States. The only way that the local organization can work effectively is if people can share information quickly and efficiently so that the entire organization, spread all over the globe, can move in one direction. Before information became a democratic product, it was impossible to get a global organization — large numbers of people — moving in the same direction at the same time because just the amount of energy spent in distributing the information would have been so great that by the time the last person in the information food chain found out what he or she was supposed to do, that direction would have been changed.

Now, information is shared so quickly at Apple that in response to events in England, the manufacturing line in Singapore can be changed almost instantly. At Apple we practice what is called "just-in-time-manufacturing," which literally responds to orders in a dynamic fashion and manufactures personal computers as needed. What's the point of spending an enormous amount of money building up inventory unless we need to have a large bureaucracy managing the inventory. The nation as an economic resource — as a vehicle for making efficient economic decisions — has come home to me in ways that I could not imagine when I was a member of the academe.

One other factor that is very important in the information age and which distinguishes it from the Industrial Age is that the master organization depended upon compliant members of the industrial organization. The interest was on creating the organizational man. Some of you are old enough to remember William White's classic book *The Organizational Man*, in which he described the behavior of people in large organizations and pointed out that people had to submit and submerge their own identities and often their own intellects to the larger organization in order to be successful. Well, in the information age, that sort of behavior is simply not going to do. The information age — because it is understood that large organizations are inefficient and that organizations must be smaller and quicker and more efficient and more quick to respond — is going to require people to make decisions quickly, make decisions on the spot and under pressure. We need institutions and organizations that believe in the power of the individual.

Also, we no longer have a few economic colossuses sitting at the top of an economic board essentially dictating to the rest of the world's economic boards what they will buy, at what price they will make that purchase, and when they will receive that particular item or commodity. Instead of a local-economic pyramid, we now have a global-economic network, and you cannot have a network unless information flows easily and efficiently to all nodes.

Finally, just as the Industrial Age was promoted and accelerated by organizational geniuses, i.e. people who understood how to pull together large organizations and help them move in one direction, the information age is also going to depend on an organizational genius, but a new kind. Not the kind of genius that results in the creation of large, complex organizations but people who understand that organizations are only going to succeed to the degree that they enable information to be produced

at the democratic source and to the degree that they promote the power of individual organizational members so those individuals contribute to the organization all that they are capable of contributing.

Now, what are some of the characteristics that I think will come under this great transition?

■ One characteristic we're going to have to promote as educators is a new way of thinking about the organization of intellect and a new attitude towards that organization. Unless we understand this, I'm afraid that 20 years from now we will be in a conference just like this one. Rather than talking about the possibilities, we will be talking about the tragedies and the missed economic opportunities because we did not understand that the world was changing under foot and we had to change with it.

■ Another characteristic we have to be very mindful of is that people have a fundamental need to communicate, whether they are communicating in the caves at La Cove or the Acropolis or painting pictures the way (Leonardo) da Vinci did or looking at a model of a DNA. Communication is the cornerstone of a new society that we are going to have to build. A society which is going to be characterized by a continuous and persistent passion for learning.

We cannot afford to let any of our fellow citizens go to waste because we are in an economic war. Learning must take place not only at any time and any place, but for all Americans.

What will this learning society look like? What will be its characteristics? Will it be the kind of society that we want to make some sort of investment in? I would say the answer to the latter is "yes." We're going to have to build a society in which learning takes place **anytime**. More than just anytime in a true learning society, learning must take place **any place**. If you look at the number of learning experiments going on in community colleges, you quickly understand that community college leaders understand this imperative far more readily than my colleagues in four-year colleges. Community colleges have reached out with industry to create learning sites outside of the formal academy. In addition to any place in a learning society, learning must take place for **any person** of **any age**.

You've seen the statistics in *Workforce 2000*; you've looked at the trends; the implications are clear. We cannot afford to let any of our fellow citizens go to waste because we are in an economic war. Every person must contribute to the effort if we are going to emerge from economic competition able to generate large numbers of jobs for large numbers of people. Learning must take place not only at any time and any place, but also for all Americans.

Also, learning must take place on **any topic**. Here we must understand when we talk about any time, any place, any person, any topic, we ought not to be putting barriers to learning on topics because of gender or racial or ethnic stereotypes. We must tell young Chinese students that if they want to become rap singers, that's what they ought to do; we should tell kids in the ghetto that if they want to become physicists, that is a dream that they ought to aspire to; we ought to be telling young women that if they want to go on to become computer scientists and mathematicians, that's a realistic aspiration.

Finally, learning should take place in **any sequence**. When I talk about non-sequential learning, I am reminded of a little bit of autobiography.

When I was a graduate student of the University of Rochester in 1967, I was given an assignment to teach a physics class to a group of pre-med students. All of these students come at you with one interest in mind — and it's not learning the subject, but getting an A. They say, "Oh, Professor Gifford, if I don't get an A in this physics course, my mother will have a heart attack because she's been saving for 23 years to make sure I go to medical school, and I need an A in this course to get in."

I was determined to transform physics from a grunt course in which students worked solely for the grade into a course where students worked for the knowledge. I worked hard and followed the sequence in the book. It was a miserable experience. I started with mechanics; I went to optics, moved on to electricity and magnetism to nuclear physics and then talked about implications of this work. It was the traditional sequence, and at the end, I found myself literally wasted. I wondered why this course was not working for me, why the students weren't getting excited, and why I felt so deflated at the end.

The following year I decided to do something different. Instead of teaching the course sequentially, I started with the last chapter, which talked about impli-

cations of physics for our society. It talked about the applications of physics to medicine, it talked about space travel, and it talked about how physics would transform the way we manufacture electronic components. It also predicted the age in which computers would become plentiful.

I started with that last chapter and said to my students, "You won't understand this chapter completely, but here is the point of arrival. The point of this course is to get you to this last chapter and to get you to understand the first two lectures." I gave the two lectures. The students asked questions, and I said, "Hold on to those questions and let's see how it goes." Then, I flipped back to the beginning of the book and started going through it. Every time I arrived at a point that the students could make a connection to the last chapter, I would flip to the last chapter.

We literally made up a syllabus each week as we navigated through the book in a non-sequential fashion. It was an exciting instructional experience. My students remained late after class. I couldn't get them out of the lab. We met on Saturday mornings for problem-solving sessions. They called me at home and disturbed me, but it was terribly exciting.

At the end of the course after the department-wide final examination was administered, the chairman of the physics department and my graduate advisor called me in and said, "Bernie, I know you've had problems with this course in the past, and one of the reasons we assigned you to it again this summer is we wanted to give you an opportunity to rise to the challenge. But," he said, "did the pressure of doing well lead you to give out the final examination?"

I said, "Professor Gold, absolutely not."

He said, "Well, tell me what did you do?"

I explained how I taught the course; I showed him copies of the syllabus; I pointed out how we changed the syllabus virtually every week; I said, "Examine my students. I assure you if something is wrong, it is not because I gave them the exam."

All my students got a B, or better, on the exam, and that was unheard of. The chairman made me promise not to talk about how I did this; he was afraid I'd embarrass some of the more senior professors. That exercise made me think about the power of non-sequential learning.

Many of you have had similar experiences. We must change the way we teach. We must abandon the traditional model where we take information and pour it into students' heads. We take data and we pour it in, we dump in statistics, we dump in facts, and we put it all in a certain order. When we do, we produce nonsense for many students. Gibberish. And the great tragedy is that from this nonsense we get the tragedy that Jonathan Kosalt talked about in *Illiterate America,* where he pointed out that one-third of the nation could not read that sentence.

It is clear that we are going to have to change the way we educate people.

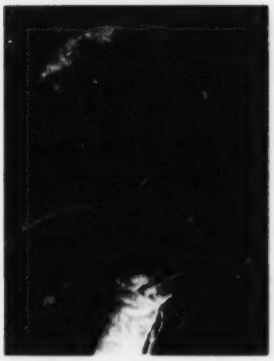
We're going to have to confront the attitude about the relationship between education and schooling relationships talked about by Mark Twain when he said, "I never let my schooling interfere with my education." The fact is that for too many people schooling does interfere with education because for too many people schooling is the neat compilation of the linear ordering and the non-interesting compiling of information in a predetermined sequence. A sequence that might not be the best way to energize a particular student to take advantage of that student's style of learning.

There is another reason why we must promote non-lineal learning. Many jobs that depended on rote learning, such as an electronic assembler or a tractor operator or a statistical clerk, are disappearing. The jobs that are increasing are those that require some familiarity with the information age and its tools. Jobs for data processing operators and for computer systems analysts and programmers are increasing at an astonishing rate. We will do a great disservice to our young people if we do not prepare them for the new realities and the transformation of our economy from an industrial-base economy dependent upon traditional forms of hierarchical organization and submissive workers to an economy that is built on the importance of information, dynamic organizations and empowered individuals.

When I talk to people about non-lineal learning, I tell them that what's really going to make non-lineal, non-sequential learning successful is the integration of voice, text, graphics and video. Their eyes glaze over, and they don't quite understand. In fact, you can integrate all these mediums of communication. We are on the verge of technological transformation and change when all these technologies will be integrated into the learning environment.

Dagnija D. Lacis

Vice President for Educational and Marketing Services, Unisys Corporation



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Thirty-five years ago General Electric installed the first commercial computer for accounting and scientific use. That was 1954 when the work force had no knowledge of computers. News articles described computers as giant brains or as high-speed calculators with the voltage turned up. In 1955 when they lifted the Univac I Computer into New York's Metropolitan Life Building, 3rd Avenue was closed for three days. Three decades later, we carry computers in our pockets and encounter them in our appliances, cars and offices.

We get an idea of what the year 2000 will bring by looking at the changes in computing that have occurred in the last three decades. You can see the speed with which the information industry is changing. It took 300 years for books to be accepted as a useful medium for public information; we embraced computers in 35 short years.

The '60s could be characterized as the mainframe decade, when major institutions depended on large centralized computers. Minicomputers became prevalent in the '70s and began to challenge the large, centralized facilities. The present decade can be characterized as the microcomputer era. Even though the micro was introduced in the '70s, it was in the '80s that the boom was realized.

Most experts believe that the '90s will be the decade of the networks. Worldwide the cry is heard: "I want my micro to talk to a mainframe or other micros in the building." By the year 2000 we will find computers of all sizes, vendors and types communicating easily with each other.

The environment, or institutional unit, serviced by the computer has also changed. In the '60s, mainframes served the corporation as a whole, generally in payroll, personnel and accounting. But in the '70s, individual departments began purchasing minicomputers for their own special needs. And, in the '80s, individuals were requesting personal computers for each desk. The corporate mainframe and the departmental mini are no longer seen as sufficient. In the next decade, most organizations will be networking all the computers at various levels for the sharing of information and resources. In the first two decades, users were aware of the operating systems that initially were batch-oriented and quite unfriendly to all but the most technical of users. But the new generation of users will not know or see much of the operating system. It will be transparent to them.

In the past, the computers were used by a small group of highly technical people who built complex systems from scratch. Now, the population in general is using simple off-the-shelf packages to do complex operations. Therefore, the technical skills required in the future will be in the applications themselves, not in the operation of the computer.

Another way of illustrating the contrasts between the decades is to remember the long lines at the dispatch window as people waited to submit jobs for batch processing. The call of the '60s was, "Take a number." When each department had its own minicomputer, the cry changed to, "Where's the technician?" Even though departments were short of technical staff, they wanted to modify software.

Today off-the-shelf packages for personal computers are so flexible that we can say,

"I did it my way." And, as we move toward increased networking and group use of resources, we'll be saying, "We did it our way on the network."

Times have changed. As the saying goes, "The future ain't what it used to be!" Meaning that the type of workers you prepared in the past will not be the type we need in the next decade.

A worker used to stand on an assembly line in front of a vat of wood pulp, or some other chemical process. While watching gauges, the worker used muscles to control the valves and motors. Today, a computer monitors the vats. Computer screens report the status of the brew. Work used to be an independent physical process. Now, the computer takes into account the whole factory operation including other vats in other places. The worker must understand the information on the screen and interpret its meaning to the larger network and process. Action taken at that computer station will be known up and down the line, influencing other processes far away.

You prepared the work force in the past and through your contributions we can remain productive and strong.

A foreman at Ford used to stand behind workers, making sure that a 53-pound bucket seat was dropped into a Thunderbird every 24 seconds. Not anymore. Now he supervises a worker who looks at a computer screen to oversee a robot that does the work. The foreman supervises thought — if that is possible. The job has become intellectual, demanding new and higher levels of abstract thought. The foreman requires different skills and so does the worker.

I am here to suggest that you can prepare the work force of tomorrow. It may seem impossible, given the rapid change that characterizes our times and culture, but you prepared the work force in the past and through your contributions we can remain productive and strong. We all grope a bit as we reach to the future, that's part of the game and that's why we're here — to grope toward a future that builds on our past heritage and leads to a productive future.

I will identify three contributions you can make that will deeply influence the future work force.

- Give us people who are literate.

By this I mean, give us people who can read. People who are comfortable with the use of letters, words, sentences and numbers. We are bombarded with statistics on the literacy problem, but I want to make it clear that our illiteracy rate is a national shame. We walk down the street scarcely aware that every 10th person can't read or write. We must declare war on this national tragedy.

The illiterate student represents a lost segment of our society. A segment that can't participate and stands on the sidelines and watches while the rest of the community soars through life.

By the ninth grade, a good portion of our children have dropped out of school or are at risk of dropping out. A common characteristic is poor reading skills. For one reason or another they have fallen behind in reading, and when they are scheduled into more advanced classes where reading is taken for granted, their lack of reading skills causes them to fall behind in other courses, making their whole school experience dismal. So, they drop out.

By the year 2000 there will be very few jobs that do not require reading skills. The jobs will be technical, sophisticated and intellectual, requiring a solid education. The growth trends favor the service and information industries rather than manufacturing and manual-labor-related industries.

The illiterate student represents a lost segment of our society. A segment that can't participate and stands on the sidelines and watches while the rest of the community soars through life. This problem affects you, personally. When you call a washing machine repairman, do you know that 25 percent of them cannot read the repair manual? They bring the book but only look at the pictures as they tear your machine apart. We could live with that if we had more places in our culture for people who can't read. But there aren't many places left for such people in our production-oriented culture.

The statistics on this problem vary slightly among the sources and indicate that 24 million Americans are functionally illiterate, meaning they may know the letters of the alphabet, but they can't read and understand the job ads or fill out application forms. The Department of Labor estimates that 70 percent of the unemployed lack the basic skills to be trained for more technical jobs.

On any given day over 22,000 inmates are in the Los Angeles County jails. Of these, 11,000 can't write a note

to their lawyer or read the papers associated with their sentences. That's just the English speakers. If you include the non-English speakers, then it's not 50 percent but 75 percent who can't read. Even when they're not in prison, they can't read a grocery list or write a check. According to James Painter, president of the American Jail Association, there are about 300,000 inmates in our prisons nationwide and their average reading scores lie between the third and fifth grade levels.

When a person can't read simple notices, or the front page of a newspaper, or can't use a common PC keyboard, it's a loss to the individual and a loss to society.

A manager in a muffler factory hides his problem. He gets by asking his wife to read the bulletins from work. But when the manager is sent to school to learn the computer system that will soon automate the plant, he sinks. He is caught. He is terrified. He turns to crime, to welfare or to a community for help.

We need a society that is pulling together to conquer this problem.

Many tools and programs can be used to attack this problem. Educators have produced software packages that show great promise in the teaching of reading using a technology that wasn't available 10 to 20 years ago.

State and federal programs have given the dropout student a chance to go back to school. The educational and business communities have formed partnerships to provide compacts and incentives for students to stay in school and perform. This is what we need: A society that is pulling together to conquer this problem.

Your greatest contribution to our future work force may be to create programs that welcome illiterates to your campuses for remedial help in reading and writing.

Other tools are also available, but we need to use them. Are you using them? Your remedial programs need to use all the technical advances available in this battle. Whatever tools can be found — technical, organizational or personal — should be brought to focus on this issue, or one-fourth of the future work force will be disqualified for most of the jobs. We build more schools, but fewer people know how to read. Why? We design esoteric curricular programs in hundreds of specialty areas, but fewer people know how to read. Why?

The work force of tomorrow must be comfortable with numbers and letters, with keyboards and with the use of desk-top equipment. We need a literate work force. You can significantly enhance our future by directing resources and programs to wage this national battle and win the literacy war. Your greatest contribution to our future work force may be this: to create programs that welcome illiterates to your campuses for remedial help in reading and writing.

You can enhance the work force of tomorrow through a second contribution.

■ Give us people who are application literate.

By this I mean, give us people who are comfortable with the common computer applications associated with each discipline. Colleges should give students a wide variety of personal computer experiences, associated with each discipline and course.

Suppose we need technical writers, but they are not experienced with desk-top publishing? What would we do with them? Most industries have thousands of products which they build, market, sell and support. Each product requires an installation manual, a user manual, a training guide, a brochure, a capabilities manual, a product announcement plus many more internal review books and product descriptions.

All of these require not only good technical writing skills, but also a capability to be able to master word processors, graphics tools, CAD/CAM, video editing tools, text processors and editors, etc. The systems are getting easier to use and the user interfaces are more adapted to the people who use them.

But for today it doesn't matter whether the screens will get larger or the keyboards smaller. What matters is that students become comfortable with the things computers do. Every discipline from history to art has ties to the computer whether through data bases within that discipline or through simulations of that specialty area.

You could find examples from any discipline or topic to illustrate the new complementary support that computers give to our intellectual life. A surprising one for me is music. Musicians can now compose pieces of music on microcomputers. Music editors enable a composer to create music scores that can be played instantly by an orchestra of synthesized instruments.

The composer can experiment with different sounds.

A score can be played with an oboe in the tenor line, or with a banjo in the tenor line, and then repeated with other instruments until the composer likes it. This is like having an orchestra of 1,000 different instruments and sounds standing by to play various segments of the piece, ready to change keys instantly, or to add new sections. Instead of requiring an orchestra and a half a million dollar studio to produce music, a $2,000 PC with the right software enables a musician to compose, arrange, play and produce music. This couldn't have been imagined even five years ago.

Much of the music you hear nowadays was produced entirely with synthesizers and a desk-top computer. The bonus for producing music in this manner is that the computer can print it out, note perfect and camera ready for publication.

For another example of current tools that prepare people for work in their specialty, consider the field of TV production and graphic art. Scenes that you see on the screen may be video materials that were created and edited by using desk-top computers. In these video segments, real-world video scenes can be intermixed with computer graphics and special effects all done by aspiring artists who whimsically explore other worlds of sight and relationships of shape, color and movement. Skill in the use of these tools is highly valued in industry as we begin to present ideas, products and information through computer presentation systems.

Some of you probably have used a graphics mouse, but the advances in the past few years are astounding. The merging of video with computer graphics gives new options for presenting ideas, drawing plans, trying simulations and inventing new objects. Tools available even three years ago are crude in comparison to what you can do now on the common desk-top micro. Using a common home video camera, a live shot of you can be incorporated on the PC screen. The picture can be captured at any time and later brought back and incorporated into other graphics as a part of a general presentation.

Since you can point the camera at any photo or any scene, the still shots you capture are useful in building illustrated classroom lectures. Or, you can create a promotional "film" about your college, but the film is on floppy disk, showing still shots of campus life. It's easier to mail a floppy disk to alumni than a video tape.

Are your art students, or your marketing students acquainted with these tools? They are appropriate to many disciplines, and your students should be comfortable with them today in readiness for tomorrow.

Another example lies in the field of education itself. Today's colleges and technical schools, like their K-12 counterparts, are being challenged by educational reforms. Research on the use of mastery learning, a concept introduced in the '60s, showed it to be extremely effective in increasing student competencies in the classroom.

For every dollar you spend on education, we in industry spend about eight more giving specialized training.

The original concept of mastery learning was that students could progress at their own pace through the material in the course. The student's pace through the course was limited only by the rate with which the student could master the instructional objectives dictated by the curriculum. In theory, all the students would eventually attain the same level of proficiency though some would complete sections earlier than others. The key to success of this approach is helping students focus their efforts on those skills which had not yet been mastered. This requires frequent testing, assessment and individual curriculum changes.

Variations of mastery learning have been used by educators with great success where the instructional objectives were clearly known and where students were frequently tested and assessed. These teachers had daily information on each student and had the opportunity for timely remediation and curricular adjustment at the individual level. The concept of mastery learning made self-paced learning possible.

Despite proof of its benefits, mastery learning was not widely used. The main reason — it was very labor intensive. Instructors who tried to implement a mastery-learning program found themselves buried in daily testing, scoring and complex record keeping, all of it precluding them from giving individualized remediation to the students who had fallen behind.

But with the micros available today, there are computer-managed instruction packages (CMI) that automate most of the clerical tasks demanded by the mastery-learning theory. These include automatic test generation, scoring and record keeping. The systems are able to generate reports on individual students, on the whole class, on comparisons between classes, and between on

and off campus courses. Individualized letters to students and parents can be generated and compact, incentive programs maintained. A teacher does not have to be a technical genius to use these systems. The computer simply relieves the instructor from clerical drudgery while providing the detailed and timely information for effective remediation and instruction.

If you have teachers who are not introducing students to the computer tools and resources that accompany each discipline, those teachers are not reading their journals. They are not staying current. They are not preparing the work force for tomorrow. Where will industry obtain application literate people—people who are comfortable with the things computers do, people who know that the music editor or the publishing program of tomorrow will be even better and easier to use but who can also use the general tools as they exist today?

Let industry train them in the specifics of tomorrow's packages. For every dollar you spend on education, we in industry spend about eight more dollars giving specialized training. But the general starting platform is provided by your own courses. Are you producing application literate people? Do your teachers assign students to explore computer support in all disciplines? The work force in 2000 will be led by people who are application literate.

And now a third contribution by which you can enhance the work force of tomorrow.

■ Give us people who are culturally literate.

We need people who are well-rounded, balanced and wise about their specialty and about the human condition; people who are technically competent and culturally considerate; and people who are able to operate and compete in a global economy, able to function in a multi-national and often multi-lingual environment.

How would you know this culturally literate person? What are the identifying marks?

■ A culturally literate person is acquainted with our heritage. If your curriculum allows technology students, for example, to graduate without a few credit hours in the humanities, how will they appreciate the human condition, our heritage, and the general goals of our culture? Our heritage is preserved in world literature, languages, film, history, art, music and theater.

The last two decades required the services of that proverbial "techie," the fellow in white socks and sandals with pocket protectors who could write compilers and fix frazzled applications the night before registration. But in the next decade computer systems are going to be so flexible and easy to use that everyone will be using the computer themselves and sharing their work.

Today the global world of computer networks and international markets requires every employee to be a marketer with interpersonal skills and comfortable human relationships. The cross-cultural skills needed to operate in today's market demand personal skills as well as technical skills. How much more so tomorrow?

■ Another mark of culturally literate people: They are at ease with a variety of media, not just books, not just videos, not just computers. Culturally literate people are acquainted with the grammar and operation of all media.

Look at the variety. The CD disks provide encyclopedias of information in wide areas of knowledge which you can browse, print or scan. The video disk brings our heritage to the screen in any desired order. Computer graphics let us simulate anything we can imagine and represent it in terms of pictures and charts. With a speech board, the PC becomes a tape recorder with on-demand replay of any speech segment. Add music and text and don't forget the hard disk with its pictures and data bases.

Does your curriculum acquaint students with the use and operation of a wide variety of media? Most of the world's important ideas have been recorded on film as well as print, but today's graduates could more easily write a paper than produce a film. Tomorrow's work force will face a cadre of media. They should be comfortable with more than just one or two.

■ A culturally literate person is one who is thoroughly grounded in the technology of our culture. This does not mean that he or she would need to be well-trained in computer science even though this is the information age. Tomorrow's systems will be adapted to the user's own area of expertise in such a transparent way that the user will not even be aware of having to adapt his behavior to fit the system. The user will simply concentrate on the equipment and procedures unique to his or her specialty.

For example, there will be electronic note pads, electronic sketch pads, hand-held scanners and electronic white boards all metaphorically similar to paper pads and chalk boards. They will operate independently or connected to the network. Graphics on the screens will have paperlike forms, charts and journal metaphors, complete with turning pages.

The purpose of the graphics and icons is to allow users to operate in a highly technical environment by using concepts and procedures with which they are already familiar. The keyboard of the future may be split

in half and tilted outward to avoid the unnatural tension caused by flat keyboards.

As an example, consider what a hospital system might look like in the near future. The screens on central desks will become larger and clearer. The patient's chart, X-rays and photos — his entire medical history can be windowed to the screen as needed. As windows move on and off the user screens, even the doctor's hand-held notebook, that gives flexibility to the preservation of notes and ideas, can be viewed.

As an example, think of a cleft palette baby with about 14 years of work that has been charted and recorded. The full history is available to doctors and nurses. Photos from various stages of treatment can be compared visually by the physician and electronically by the system. The photos on the screen can show the baby soon after birth and on throughout its 14 years.

In hospitals, large central screens will allow X-rays, medical prescriptions and nursing comments to be archived, but accessible. The screens will enable nurses or doctors to assemble pertinent pieces of a patient's journal, comparing X-rays with views from medical literature, plus entrance and billing records. It will be a flexible, dynamic chronicle of the various stages of disease and treatment.

We in industry contribute products and services to the culture. You in colleges contribute by preparing the workers. Society will fail unless we prepare a viable, flexible graduate.

These views of the future are dreams at the moment, ideas which someday will require change and adjustment. Students should use a variety of computing equipment to make them realize that they can change from one keyboard to another, or from one procedure to another, without anger or fear.

I have suggested that you can significantly enhance the work force of tomorrow.

We need literate people. Will you provide them? People who can read and who are comfortable with writing and reading? Will you join me in the fight for a literate work force? You win wars by focusing resources and materials, by gathering weapons and by assaulting with current and future tools. Are we committed to winning this war?

We need computer application literate people. Professional writers, musicians and artists must know how to use desk top tools. Teachers should be practicing mastery-learning theory using their CMI tools. The theory points to a new world where everyone gets an A even if it takes three or four times longer for some than others.

We need culturally literate people. Our markets are global and our networks in the year 2000 will demand people who can relate to the other people through a wide variety of media and languages. We in industry contribute products and services to the culture. You in colleges contribute by preparing the workers. Society will fail unless we prepare a viable, flexible graduate.

Someday the world's daily information may be available on a wrist-watch device, connected to a global satellite network through local cellular networks. For us to build and effectively use these future products, we need a literate and well-rounded work force to serve in our future global community.

Macomb Community College Warren, Michigan

In 1988, Macomb Community College agreed to design a curriculum in personal financial planning for UAW/GM workers. The program, "It's Your Money," was developed to provide employees with practical information to help them make personal financial decisions. The 10 modules of the program which highlight the process of financial planning and the use of financial planning tools teaches employees to use the process; to set financial goals; to analyze investment options; to understand risk management; to develop an action plan; and to identify resources for future financial guidance.

The program is covered by the UAW/GM Tuition Assistance Plan benefit and is open to all employees and their spouses.

A project team comprised of representatives of the Human Resources Center, UAW, General Motors management, Macomb CC, a benefits specialist and an independent financial planner worked 60 hours to finalize the curriculum. Pilot testing and a "train the trainer" phase occurred before program implementation.

—Catherine B. Ahles
Vice President for College Relations

Chester E. Finn, Jr.

Professor of Education and Public Policy, Vanderbilt University

Chester E. Finn, Jr., is a professor of education and public policy at Vanderbilt University, a senior fellow for the university's Institute for Public Policy Studies and research director of its Washington office. He is also director of the Educational Excellence Network. He served as assistant secretary for research and improvement and counselor to the U.S. secretary of education. His career has reflected his interests in education and public policy, serving as staff assistant to the president of the United States, special assistant to the governor of Massachusetts and research associate at the Brookings Institute. Dr. Finn has written six books and holds his doctorate from Harvard University.

My concern today is with the quality of the American work force in the late 20th and early 21st centuries, a time which the economic strength of our society and the prosperity of its citizens are going to depend enormously on the caliber of the education that our people have. Work force considerations are not the only reason to attend to educational quality. We also want to live in a secure nation with a vibrant culture, strong civic life, safe and well-functioning communities, and conscientious and effective parents, to mention just a few of the non-economic results that are associated with education.

But if we aren't economically competitive and prosperous, these other goals will prove far harder to attain. And if we aren't well-educated, we aren't likely to be prosperous. That means all of us, not just the fortunate few. David Kearns, the Xerox CEO, says we have today the "makings of a national disaster." "More than a third of tomorrow's work force will be minorities," he comments, and "half of those are kids growing up poor. A fourth drop out and another don't come close to having the skills to survive in an advanced economy."

The jobs are getting more sophisticated even as our educational outcomes are getting less so. This discontinuity is as serious as any threat facing the United States today.

Consider some recent comments by John L. Clendenin, board chairman of BellSouth Corporation: "Even the telephone operators search a huge electronic data base to retrieve and deliver information to customers. Similarly, most of our clerical jobs require word processing, computer skills or both."

Yet, what do Clendenin and other major employers find when they look at those seeking jobs in their companies? "In 1987," he reports, "fewer than 30 percent of employment candidates met our skill and ability requirements for sales, service and the technical jobs. Only 15 percent scored at the proficient level on our typing test. We estimate that fewer than 1 in 10 applicants meets all our qualifications and standards."

We have heard dozens of similar comments from corporate CEOs. We receive much the same message from government employers, both civilian and military.

An unpublished study by William B. Johnson and Arnold H. Packer, who also wrote the well-known *Workforce 2000* report for the Hudson Institute and the Labor Department, puts some numbers on this problem. They used a Labor Department rating system that ranks the language skills need for particular jobs on a scale from 1 to 6, with 1 being manual labor and 6 being what scientists, engineers and lawyers do. On that scale, they found that, in 1984, the average skill level for civilian jobs in the United States was 3.0, which is roughly the level of retail salespeople and skilled construction workers.

For the 26 million new jobs to be created between 1984 and 2000, the average language skill level is 3.6 But when we analyze the literacy skills demonstrated by young adults on the National Assessment of Educational Progress a couple of years back, we find that the average person between the ages of 20 and 25 is reading at level 2.6. Putting it more simply, the typical new job requires skills between levels 3 and 4, while the typical candidate for that job has reading skills between levels 2 and 3. Says Packer, "You're talking about a major mismatch of workers and jobs."

Unless one thinks that young Americans are basically dim, which I do not, one has to conclude that our people have the raw talent but aren't getting it sufficiently well-

honed in the course of their education. David Kearns says, "We cannot compete in a world-class economy without a world-class work force, and we cannot have a world-class work force without world-class schools."

Our people have the raw talent but aren't getting it sufficiently well-honed in the course of their education.

It isn't just the schools, of course. Those young adults whose literacy was assessed by NAEP were between the ages of 20 and 25, and many had some postsecondary education, too. More than a few possessed college degrees. But we can usefully start with the schools since most of us would agree that the kinds of skills we're talking about here need a solid foundation at the elementary-secondary level.

Let's examine some evidence, starting not with those "at risk" or who are dropping out but, rather, with students who are persisting and are apt at least to graduate from high school. Our best barometer is not SAT and ACT scores but the National Assessment of Educational Progress, which every two years tests a statistically valid cross-section of young Americans at three age and grade levels. Look at the most recent results for 17 year-olds.

Fewer than 10 percent could:

- Read with the sophistication and understanding needed to comprehend technical materials, original sources, documents and traditional college-level texts.
- Write an adequate persuasive letter.
- Successfully handle multi-stage math problems or those requiring algebra.
- Answer science questions of a level of sophistication that would equip them for college-level work.

That's reading, writing, math and science. In each of these crucial fields, few are reaching the higher levels of understanding and mastery. Their rudimentary skills are not bad. We're looking at a mighty shaky foundation for skilled and even semi-skilled employment, and certainly a weak undergirding for higher education. Think about it: roughly half of all high school graduates go on to college. But only 5 percent to 10 percent of them are intellectually prepared for higher education.

We find much the same story in history and literature. One 11th grader in three doesn't know why the Declaration of Independence was written, what the phrase "checks and balances" means, or who Atlas, Aesop and Cain and Abel were. Half cannot explain the purpose of the Monroe Doctrine or the phrase "Anchilles Heel." An incredible two thirds do not know when Lincoln was president, in which half century the Civil War was fought or what the purpose of Jim Crow laws was.

Schools, I conclude, may well be accomplishing other worthy things, but when it comes to skills and knowledge of core academic subjects, their products aren't satisfactory.

Nor are all our data domestic in origin. Every year or so we get the results from another international comparative study of some kind.. The most recent compared 13-year-olds attending the schools of half a dozen countries and several Canadian provinces. This was a test of math and science prowess. Our boys and girls came in last in math and tied for last in science.

Why are we doing so badly, even after six and a half years of school reform dating back to the *Nation at Risk* report in 1983?

There are several possible explanations. I will sketch three that seem to me especially salient.

First, notwithstanding myriad education reform efforts at the "macro" level, that may be traced in part to an odd American schizophrenia about education, we seem to have conceded that the nation is at risk and that we have what might be termed a wholesale problem. But there is considerable evidence that at the retail level people think their own children and schools are in good shape. Hence, why do anything very different?

Every year's Gallup education poll finds people giving higher marks to their own schools than to schools-in-general. In 1989, 22 percent of the public gave an A or B to public schools nationally while 43 percent gave that grade to public schools in their own communities. The difference is even more striking among parents of public school students: 24 percent and 57 percent. Another way of saying this is that more than half the parents of today's public school students give high marks to the schools their own children attend.

Why these upbeat results? One reason is that American parents have lower expectations for their children's performance and are more easily satisfied by that performance, and by the schools their children attend, than are parents in other lands. Harold Stevenson's research is quite conclusive on this.

It isn't just parents. On a recent Metropolitan Life poll of school teachers, 92 percent of current teachers said that their current school is providing a good or excellent education to its students. Where do people get these impressions? One source is the flood of cheery,

upbeat, good news press releases that pour out of local superintendents' offices and state education agencies. We're here looking at what's been termed the "Lake Wobegon" effect, a set of test results at the state and local level that most of the time convey the impression that everything is basically pretty good and getting better.

What's really dismaying is that we cannot trust a lot of those results. In a recent study of state testing programs — most of them using norm-referenced commercial tests — Dr. John J. Cannell concluded that many of them are gravely flawed in important ways, including test security. Cannell in effect accuses the education system of cheating in the way it tests youngsters and analyzes and reports their results.

The discrepancies between wholesale and retail information about educational quality, and between the actual and the press release versions of reality, are thus one possible explanation for why we're doing so poorly.

A second observation is that we've been violating what I take to be the two premier findings of education research. The first of these says that people tend to learn that which they study. The second says that people tend to learn things in rough proportion to the amount of time they spend studying them. If we expect to hold individuals accountable for having learned something, we'd best make sure that they study it — and for long enough to learn it. Yet, despite some modest movement in course-taking rates in the high schools, we still dish up for the average student a curriculum that resembles thin gruel rather than a rich, varied and nourishing menu.

Our young people spend the least time learning things — academic things — of anyone in the industrial world.

Barely 30 percent of all 1987 high school graduates actually took four years of English and three each of math, science and social studies. If you look for those who have also taken two years of foreign language and a half year or more of computers, you get down to 13 percent. That is better than the class of 1982 did. But it's still dreadful.

Our students aren't putting enough effort into it, either. Our young people spend the least time learning things — academic things — of anyone in the industrial world. They enjoy the shortest school years and day. They give the most meager time to homework. They are apt to devote the most hours to TV and part-time jobs.

We really do have something to learn here from the rest of the world, not just about total time spent studying but also about the content of the curriculum. When I was in the Department of Education, we carried out a major study of Japanese education. Let me delve into it just long enough to sketch what the typical Japanese 11th grader studies in school. Bear in mind that Japan has a high school graduation rate upwards of 90 percent, so we're talking about nearly the entire age group.

The school week consists of 34 hours. If it were a five-day week — in Japan it's actually five and one-half days, and approximately 40 weeks of the year, compared to our customary 36 — that would be nearly seven hours a day, compared to our five and one-half or six.

Of the 34 hours, eight or nine are non-academic, consisting of music, health, club activities, homeroom, physical education, home economics, etc. How the 25 or 26 academic hours are spent depends to some extent on whether you're a literature major or a science concentrator. (These two tracks, in fact, begin in 11th grade.) Here is the academic curriculum of the science major:

- Four hours a week of Japanese language study,
- Three hours a week of history,
- Two math courses, totaling six hours a week,
- Physics and chemistry, each for four hours a week,
- And five hours a week of foreign language study, nearly always English.

Not everyone pursues the academic curriculum. About 30 percent of high school students are enrolled in vocational programs. But the vocational portion of their curriculum takes up only about 10 hours a week, with 16 or 18 hours still given over to Japanese, math, science, social studies and foreign language study.

Then there are *juku*, the Japanese after-school schools. And then, of course, there is homework, too.

I'm not here to advocate that we mimic Japan. But one of the features of its education system that we need to pay close attention to is the weight and depth of the curriculum and the significant proportion of young people's lives spent mastering that curriculum.

Our federal study was not the only examination of Japanese education to reach conclusions such as these. I had the opportunity to read a first rate article by Harry Wray, an American educator who is currently visiting professor at Japan's Tsukuba University. Let me quote just his paragraph on why Japanese schools produce a higher standard of achievement than American schools:

"There are five major reasons. One, society demands

higher academic standards from the schools and students. Two, national courses of studies for every subject at every level are binding by law. They are generally quite detailed and rigorous in their expectations of what students must master. Three, each textbook has to conform to the course of studies. That means the content in terms of knowledge is much higher than would be the case for the United States. Four, Japanese schools expect and get more homework from their students. Five, Japanese high school and university entrance examinations have a very strong impact on the schools."

American people declared themselves, by 70 and 80 percent, ready for such heresies as national standards, even a national curriculum, and national tests linked to those standards.

Here I've merged a partial comparison with Japan with the issue of time. But there is also a third reason, I believe, why our current educational performance is not what it should be — and this is especially timely in the aftermath of the recent Charlottesville education "summit." It is that up to now we haven't paused in our reform efforts long enough to spell out our goals and objectives. If this were industry, one could say we have been tinkering with almost every aspect of the production process without having specified the product that we hope to produce.

Hence, we have no clear sense of the result we seek from school reform efforts. Lacking outcome specifications, we can go on forever restructuring schools, revising the curriculum and altering teacher education programs without any confidence that we'll be any happier with what emerges tomorrow. "It's like an industry that's unclear about its product," Ernest L. Boyer said to the Business Roundtable in June, "and thus is hopelessly confused about quality control."

The governors and the President vowed to do something about this, to produce broad national goals and standards (anchored, it's important to note, to international performance levels) and to issue annual "report cards" at the national and state levels on our progress toward those goals.

This is a new idea for the United States, where we've always assumed that such matters as curriculum and standards must be worked out at the state or local level. The governors and President are saying that's not necessarily so. And the most recent Gallup data show the public agreeing. To my surprise, the American people declared themselves, by 70 and 80 percent, ready for such heresies as national standards, even a national curriculum, and national tests linked to those standards.

So we may be on the threshold of a very new era in terms of what is meant by "education reform." There's a radicalization going on out there, linked, I believe, to widespread disappointment and frustration with the results of the mostly "incrementalist" changes we've attempted thus far. We're beginning to talk seriously about changing the basic ground rules of the education system, not just about making the current system work more efficiently.

In that vein, we're seeing widespread interest in the proposition that people should be able to choose their schools, the rapid spread of various bold strategies designed to ensure "accountability" with respect to educational outcomes, and some tinkering with our concept of compulsory attendance, designed to make it much less attractive to drop out of school. I wouldn't be surprised if one day we redefine compulsory attendance altogether, so that instead of being tied to reaching a particular "birthday," it is defined as an obligation to remain in school (maybe very different kinds of schools than we're accustomed to today) until attaining a specified level of cognitive skills and knowledge.

The United States is not the only country where nonincremental changes are being made in education. In Britain, for example, under the "conservative" regime of Margaret Thatcher, we see going into place right now a new national curriculum and a national testing program to accompany it. We also see Parliament establishing the right of individual schools to "opt out" from under the control of the local education authority and become, in effect, self-governing. We see the devolution of most management decisions to the school building level. And we see the right of individual students and parents to select the school they want to attend.

Education reform is in the wind in the Soviet Union, too, in Australia, in a lot of other European countries, even — believe it or not — in Japan. This is part of why we must keep an international perspective on education. If we looked only at ourselves, we could fall prey to the illusion that we're actually improving at a commendable rate, whereas when we glance over our shoulders we may

see that others are still gaining on us.

When we do look around, we see signs of mounting impatience on the part of the business community, whose leaders are now talking seriously about the failure of their various "partnership" programs to trigger real change in educational outcomes and the need, instead, to use their clout to leverage nonincremental shifts in the ground rules and productivity levels of the education system.

If the business leadership is talking that way, and the governors and President are talking that way, and if there are examples in a dozen states of pieces of the kinds of changes I'm alluding to, there is reason to think that we may actually find ourselves with a quite different education system in the future than the one we're now accustomed to.

I believe that's good. I've gotten radicalized myself. We're not doing our children justice today. We're not doing our society justice. We're not getting the results the country needs. And we do need to get them. Which means, we're going to have to jettison a great many assumptions, unthrone a lot of shibboleths, and upset a lot of apple carts.

Then and only then, will we have a serious chance of producing the kinds of educational outcomes that we already need and that life in the 21st century is going to demand.

I've been focusing on the elementary/secondary system, not on postsecondary education, but the implications are profound for what happens after high school. Just consider for a moment the amount of time and resources absorbed on most campuses in what one might call "cleaning up the mess the schools created," or what we might call giving people an adequate secondary education after leaving secondary school. Think how different our tasks — and opportunities — would be in higher education if practically all our students arrived on the doorstep with a solid grounding in cognitive skills and knowledge of the core academic subjects. No, it isn't going to happen tomorrow. It'll take at least until the day after tomorrow, and even then, for quite a while it'll only affect recent high school graduates.

Still, we could then make it our business to give all those students an honest-to-God postsecondary education, starting the day they enroll.

That's what will enable the United States really to compete successfully. We already send far more of our people into postsecondary education than any other country in the world. If we could get to the point where we're providing all our elementary/secondary students with a topnotch basic education and then also send nearly two-thirds of them on for further study, we could even find ourselves one day with perhaps the best educated and most highly skilled population on earth, instead of one of the most flaccid and mediocre.

Front Range Community College
Westminster, Colorado

In recent years, IBM Corporation in Boulder changed its mission from manufacturing to software development and systems support. IBM selected Front Range Community College to direct the retraining effort of its 2,000 employees. The project, thus far, has encompassed a rich diversity of educational content ranging from pretraining preparation to direct skills training.

Two unique courses — "Retraining Preparedness" and "Career Transition Training" — were developed in response to indicators that employee needs for adaptation had to be addressed to strengthen their prospects to succeed at retraining. The preparedness course enhances self-management skills and self confidence, improves attitudes toward change, and raises learning skill levels. The follow-up transition training course was implemented for several hundred employees who were still working toward a complete job transition.

More than 1,400 employees participated in the program and 98 percent of those trained by these efforts have been successfully transitioned to new positions at the Boulder plant.

Because of this partnership, FRCC was awarded a state grant to further identify skills needed by workers and students to effectively compete in an economy where organizational remissioning and retooling will occur rapidly and frequently and is collaborating with IBM to instruct programming fundamentals and a new sequence of theoretical courses such as discrete math, data abstractions and controlled structures. Instructors are employed full-time by FRCC to team teach courses at Boulder and another IBM site in Vermont.

—Cary A. Israel, President

Forrest P. Chisman

Director, Southport Institute for Policy Analysis and Project on Adult Literacy

Forrest P. Chisman is director of the Washington office of the Southport Institute for Policy Analysis and the Project on Adult Literacy. From 1983 to 1988 he was director of the Project on the Federal Social Role. He previously served as an official in the U.S. Commerce Department and program officer of the John and Mary Markle Foundation. Dr. Chisman received his bachelor's degree from Harvard University and his doctorate in political science from Oxford University. He is co-author of Government for the People: The Federal Social Role and of numerous articles on public policy and communications.

In recent years, a great deal has been written about "the skills gap," and the need to upgrade the American work force. Probably the best known statement of the problem is still the Hudson Institute's *Workforce 2000* report, published in 1987, although that report has been followed by a large body of literature that picks up where it left off. "Workforce literacy," is a term often used in these discussions of manpower issues. Because the term is seldom defined, the first task of any productive discussion of the topic is to attach some precise meaning to it.

Problem. Work force literacy is simply the bottom end of the skills gap problem. Twenty million to 30 million adult Americans are functionally illiterate. Their skills in reading, writing, math, problem solving and verbal communication are so poor that they cannot hold a decent job and cannot cope with the problems of everyday living. They have no future in today's economy and society, and they certainly have no future in the economy and society of tomorrow.

About half of these people are employed: 10-20 million of them. They are the secretaries who cannot type or take messages, the clerks who cannot make change, the nurses' aides who cannot understand a prescription or a chart and cannot be trusted to give the right medication. Companies that are trying to improve customer service or productivity by techniques such as statistical process control or just-in-time delivery systems want to get rid of these people.

But they can't because there are not enough skilled workers to go around. The demographics are against it; the labor market is tight; the schools do not turn out a good enough product, nor are they likely to very soon.

In short, work force literacy is the problem of those people with limited basic literacy skills who are stuck in the work place: They are the people whose problems cannot be solved by the job-specific training programs, to which American business now commits substantial resources. They are not trainable workers.

Happily, awareness of the work force literacy problem has increased in recent years. Business, education and government leaders often use examples of that problem to illustrate their general expressions of concern about the skills gap and the future of the American work force. But a closer look at both their words and their actions creates the uncomfortable feeling that many of these leaders either do not realize what they are saying or are not willing to live up to their own rhetoric.

Why is it that we spend over $150 billion per year for K-12 education for about 45 million school children; but by the most generous estimate we spend only about $1 billion on the 20-30 million adults with limited literacy?

Why is it that corporations spend on the order of $100 billion on training for their middle- and upper-level employees, but practically nothing on training their lower-level employees, who are the front lines in the battle for global competition?

Why is it that hundreds of companies profess to have work force literacy programs, but under close scrutiny, few of those programs provide more than generic instruction in elementary reading involving a few dozen employees?

There are only two current problems that can truly wreck this country. The first is the budget deficit and the second is the skills gap.

Why is it, finally, that no leading national business or educational organization with the exception of the AACJC has placed this issue on their agendas at all? For that matter, why is it not high on the agenda for civil rights leaders? Black and Hispanic leaders should be furious that so many of their people are trapped at the bottom of the job-skills ladder, and nobody is doing anything about it.

In fact, this issue is not high on the agendas of any large national organizations, with the exception of AACJC and organized labor. And while those groups may well end up being the heroes of the post-industrial revolution, they cannot pull the train alone.

By all indications, there are only two current problems that can truly wreck this country. The first is the budget deficit and the second is the skills gap. And today national leaders are abdicating responsibility for both.

This lack of foresight seems to be the national style. We can find billions of dollars to repair the damage of the San Francisco earthquake or hurricane Hugo and hundreds of billions to bail out the savings and loan industry. But we cannot make the up-front investments to repair the freeway that collapsed in Oakland or tighten up on supervision of financial markets.

We simply cannot continue this "save now and pay later" attitude. In the skills gap area, as in a great many other aspects of our active life, it will be too late to fix things after the damage is done. This country will become a second-rate economic power without the up-front capital to invest in fixing literacy or anything else. Now is the time to make the investments required.

Why don't we make them?

In general terms the answer is that this would require an epochal change in our national consciousness—from a reactive, complacent, near-term perspective to a considered, long-term investment perspective. Moreover, this reluctance to change is easily disguised by a great many lame excuses for inaction.

Some people say we can solve the work force literacy problem by reforming our elementary and secondary school system. This is obviously nonsense when 80 percent of the work force in the year 2000 are on the job today, and 10-20 million of these people are functionally illiterate. No amount of school reform will help this group. They are out of school. They are adults.

Other people say that it is useless to invest in training low-level employees because they will just move on to another job. In fact, most of the evidence shows the contrary. Workers in whom employers have invested training dollars are less likely to move on to other companies than are other workers.

Still others say that it is just too hard to develop work place literacy programs. Some say that it cannot be done, that we do not know how to do it. But this is obviously not the case . A few companies, such as Motorola, Polaroid and Aetna, have done it. They have restructured their companies to build in life-long learning for all their employees from the bottom to the top. They say they have no choice, and they say they have improved productivity and profits by this approach.

Principles. The experience of leadership companies in the work force literacy field, together with leading edge research about literacy instruction, suggest that any company can implement a successful program if it observes a few key principles:

- Instruction must take place in the work place to make it logistically easier and to give employees the feeling that it has some real relationship to their jobs;
- It must be sanctioned and encouraged by the employer;
- It should make use of materials that are clearly relevant to improving performance on the job, increasing opportunities for advancement, and about other employment issues that workers face and employers care about;
- Both employers and employees must reap some tangible benefits from the instruction;
- Finally, instruction should not be limited to job-specific training. That is, work force literacy instruction should not be limited to providing the particular skills workers need to perform specific tasks, as it is by the so-called "job audit" approach now in fashion. This form of tailorism is not in the long-term interest of employees or employers in a fast-changing economy.

These are fairly simple principles to apply. The surprise is that more companies do not apply them. If work force literacy programs are that easy to implement, why do so few companies implement them, and what would change this situation for the better? The short-term answer to this question is fairly clear, and it is possible to

speculate on the long-term answer.

Solutions: The Short-Term. The short-term answer is that the overall state of the art in the adult literacy field is so poor that there is nowhere companies can turn to get help with their basic-skills problems even if they recognize these problems and even if they want help. There are no reliable pre-packaged curricula they can buy and very few experts who can help them.

Almost all the existing efforts are tailor-made and there are just too few tailors. Moreover, most of us cannot afford tailor-made suits, particularly small companies with limited budgets for training.

If a shortage of expertise is the major short-term problem, there are three key elements to a short-term solution to the work force literacy problem.

■ First, partnerships. Almost all of the existing success stories in this field are based on partnerships between companies and public agencies that recognize there is a social good as well as a corporate good involved in work force literacy. These public agencies are prepared to tailor service to the needs of companies at a reasonable price. A great many of them have been community colleges. This should be no surprise. Community colleges have the size, the range of staff and expertise, and the tradition of working with local business that ideally suit them for this role.

As a result, an important part of the solution to the work force literacy problem is for community college leaders to develop their expertise and entrepreneurship in this area. They should make more aggressive efforts to develop and market work force literacy products to business. Community colleges can play a critically important role in closing the job skills gap; it is up to their leaders to decide whether they are prepared to play that role. If so, a larger investment in partnerships for work force literacy must become central to their missions.

■ The second element in the near-term solution to the work force literacy problem is to upgrade the adult literacy field generally so that more providers, including community colleges, can offer a high-quality product in the work place and elsewhere.

Recently, there has been significant movement on this front by the federal government. In mid-1989, bills were introduced in both the House and Senate that would upgrade the literacy field in a number of ways. Probably their most important contributions to the field are provisions that would establish a National Center for Adult Literacy: a new, free-standing entity representing the interests of everyone concerned with this issue. The center would have as its tasks: research and development to upgrade the state of the art in literacy instruction; dissemination of information and training in model, best-practices to all providers; and setting goals as well as monitoring results.

The House and Senate bills would establish corresponding state centers, provide funds for staff development and investments in instructional technology, mandate coordination and planning efforts at the state level and more. In short, they would give community colleges, companies, vendors and everyone else involved in the literacy effort the tools they need to do the job.

Community colleges can play a critically important role in closing the job skills gap, and it is up to their leaders to decide whether they are prepared to play that role.

Right now there is absolutely nowhere that literacy professionals or others concerned with this issue can turn for help of this sort. The House and Senate bills would provide that help. And the price is right. The provisions of these bills just mentioned cost under $200 million. As a step toward developing more of an investment mentality in education and business, this is a bargain for 20-30 million adults.

■ The third element of a near-term solution to the work force literacy problem is to create more success stories — more examples of how companies can create successful programs — both to refine the techniques for providing work force literacy services and to encourage more companies to invest in work force programs. If they are to accomplish either of these goals, success stories must be on a large scale. They must be corporate-wide, or a consortia of small businesses in a locality, so that the results can be measured in meaningful terms: in terms of whether productivity grows, business prospers, and a wide range of employees have better opportunities. Meaningful success stories must show progress in real-world terms.

Here again, the federal government may be able to provide some help. The literacy bill introduced in the House in 1989 (H.R. 3123) proposes $100 million per year for five years for large-scale, public-private demon-

stration projects of this sort. Any public and private partners — such as a community college and a company — could apply. The average grant would be about $2 million. The only strings would be that the projects must be replicatable and designed to show bottom-line results, and that the partners must put up some earnest money.

The 1989 education summit between the president and the nation's governors began to show the path that change must take by stressing three key concepts: leadership, standards and accountability.

Solutions: The Long-Term. Partnerships, upgrading the literacy field and engineering more success stories will help to start the nation down the right road in addressing the work force literacy problem. But, by themselves, these approaches will only take us so far. What about the long run?

There is a growing consensus of opinion among almost all concerned parties that we will never solve the work place literacy problem, or any other education problem in this country, unless and until we take a different view of education. The 1989 education summit between the president and the nation's governors began to show the path that change must take by stressing three key concepts: leadership, standards and accountability.

■ In the work place literacy area, leadership means first and foremost high-level people taking this problem seriously: CEOs, presidents, governors, major professional associations in the business and education fields. The American tradition of individualism is so strong that we almost always trivialize the problems of able-bodied adults. We tend to blame the victim, to assume that people can make it on their own. The American response to issues such as welfare, homelessness and limited literacy is a combination of weak public programs and voluntary efforts that can't possibly do the job.

We cannot afford these archaic attitudes any longer. Unless and until the major leaders of American society accept lifelong learning for all adults as a regular, expected part of American social and economic life and are willing to pay the bill, we will get nowhere.

Money is not the major problem. If the federal government doubled its present commitment to adult literacy, if states invested just 2 percent of their education budgets in it, and if companies redirected 5 percent to 10 percent of their training budgets, there would be money enough. The issue is leadership. The House and Senate literacy bills mentioned above are not primarily money bills. They cast the federal government in a leadership role. Their aim is to enable states, localities, schools, companies and others to come to grips with the literacy problem, not to solve that problem from Washington. We need more leadership of that sort in all sectors of our society.

■ The second concept essential for a long-term solution to the work force literacy problem is standards. That means defining exactly what basic skills people should master and finding ways to determine when they have achieved mastery. We know how to define and teach the cognitive skills: reading, writing and math. We even know something, although too little, about problem solving abilities. But cognitive literacy is a continuum. How much is enough and for what purposes? What should be our goals in trying to upgrade cognitive skills for the work place? How can we tell learners and employers whether they have met those goals?

We have no good answers to those questions, and that is shameful. Grade-level achievement scores are demonstrably of very little use. High school degrees are close to meaningless for these purposes. All we can say now is that you know a functional illiterate when you see one. That is not good enough. It feeds the mediocrity of the literacy field. It discourages companies and others from taking literacy seriously.

We must develop national norms for basic literacy attainment that are meaningful to employers and employees: something like a basic skills equivalent of the S.A.T. except that these norms must be relative to different employment situations. One size does not fit all. And we must ratify by leadership, and if necessary by law, that these norms can be used only for inclusion, not for screening people out. That is part of the leadership responsibility mentioned earlier. But we must also go further. The basic skills that employers need and want are not just cognitive skills. They are also attitudinal. They include skills or habits such as team work, getting to work on time and taking responsibility. We have not even laid a glove on defining, let alone measuring or teaching, those basic skills, yet. And we must. The lack of adequate standards for basic skills attainment would be a major challenge to the education community, busi-

ness and government. They should be prepared to join in a crash effort to develop national goals and standards in this field.

In November of 1989, Secretary of Labor Elizabeth Dole announced the formation of a Secretary's Commission on Achieving Necessary Skills aimed at meeting this challenge. Community college leaders should be in the forefront of that effort because the question of standards is critical. Properly developed, standards are empowering for everyone concerned. More to the point, they are a precondition of any progress.

■ The third key ingredient in a long-term solution to the work force literacy problem is accountability.

There is a too easy acceptance of mediocrity in the adult literacy field today. People assume that a second-rate problem deserves a second-rate solution. The present system is almost entirely input-driven. People are rewarded for how many learners they have in class and for how long. Practically nobody asks whether these people are actually learning anything that will be of any use to them or anyone else, and there are indications that most of the 3-4 million people in literacy classes today are not. Drop-out rates are high; learning gains by any available measure are minimal. No wonder business and government do not want to invest in this system. No wonder companies that could and should be developing better learning systems have abandoned this field.

Community colleges and others should become actively involved in designing new systems of education that reward results, both in the work force literacy field and elsewhere. The bottom-line orientation that work force literacy programs must adopt may suggest that this is the area of the education field where pioneering efforts to develop output-oriented systems should begin.

Work place literacy is the easiest part of the skills-gap agenda. In the world of work there are both willing learners and employers who need each other, a controlled environment for learning, and at least the prospect of establishing clear goals and relevance for everyone involved by keying the system to competence on the job. These are the conditions that make the problem solvable if all concerned, including community college leaders, dedicate themselves to building a high quality work force literacy system. We need a system that can brag on its results: its output in terms of improving lives and productivity.

Community college leaders must help to create and accept national norms and then be prepared to accept rewards — payments — only if they can deliver those results. If they do not, somebody else will. The public education system in America is being given one last chance, both in the literacy field and in other aspects of instruction. Community college leaders can either get on top of the work place literacy problem and be the stars of the show, or they can abandon the stage to proprietary schools, commercial trainers and other providers of instructional services.

Community colleges must not shy away from this challenge. They should be national leaders in the development of a high-quality, ac - countable work place literacy system that embodies their best traditions.

The Challenge for Community Colleges. Of course, by themselves, these generalizations about leadership, standards and accountability do not constitute a solution to the work force literacy problem. But they at least indicate that the problem is solvable. Community colleges must not shy away from this challenge. They should be national leaders in the development of a high-quality, accountable work place literacy system that embodies their best traditions. In fact, precisely because of those traditions, community colleges have a unique opportunity to create a continuum of instruction by integrating literacy into technical and vocational programs. It is an opportunity to help 20-30 million Americans become trainable workers and then train them.

Some community colleges have blazed the trail. It is time for others to broaden the road.

"The greatest benefit of the conference for those of us who are teachers was being reminded that we, more than anyone else, can make a difference. We have the key to begin solving what we see as the biggest challenge facing America."

—Trudy Williams, English Instructor
St. Petersburg Junior College, Florida

Milwaukee Area Technical College
Milwaukee, Wisconsin

At the Milwaukee Area Technical College, partnerships have been an aggressive part of our educational agenda for the past five years. As a result, we have developed partnerships with the county, the city, the Milwaukee public high schools system, the University of Wisconsin and other community and technical colleges in Wisconsin. Many of you have similar arrangements—there's nothing new about the concept.

But, unique partners and non-traditional goals can produce exciting solutions for contemporary problems. Labor is not usually thought of as a partner in educational consortia. But, MATC has an extremely successful Dislocated Worker Center that would not have been possible without a partnership arrangement with the AFL/CIO. The United Way and Wisconsin Employment Services are our other partners. This center has serviced over 2,000 dislocated workers in the past five years — providing a range of programs, including assessment and evaluation, training and referral within the same facility.

The majority of community, junior and technical colleges are located in urban settings; therefore, we community college educators have a special responsibility to serve those citizens. It is our obligation to focus on minority economic development because minorities are frequently the largest citizen population of our urban sites.

MATC has developed two significant partnerships to promote minority economic development for inner city residents: a small business incubator functioning in an inner city environment and an entrepreneurial business program targeted for minority youth.

In 1986, the Milwaukee Enterprise Center was launched through a partnership arrangement between the city of Milwaukee; the state of Wisconsin; the Wisconsin Foundation for Vocational, Technical and Adult Education; and the Milwaukee Area Technical College. The center is an incubator for nurturing small business with a mission of partnerships, jobs and minority economic development for the Milwaukee Center city area.

The Center opened with three businesses. Today, there are 54 businesses employing over 294 people. More than one-third of the businesses are owned and operated by women and nearly two-thirds are minority owned. Since they are from the immediate inner city neighborhood, 65 percent of the employees can walk to work. And MATC is the logical catalyst for such activities.

MATC's board of directors and the college's district director made a commitment which naturally flowed from the college's mission and goal to address the economic development needs of the central city. MATC's partnership role in the incubator expedited the necessary training needed to nurture the businesses of the incubator into successful enterprises.

Our other partnership in this area is one for minority youth. MATC received a grant from the AACJC's Minority Business Enterprise project, which made it possible to create an awareness project of entrepreneurial business opportunities.

MATC's programs help minority youth to explore business as a career path and to be introduced to the key issues facing small businesses. Workshops and seminar activities and an essay contest reached over 4,000 young people in the Milwaukee metropolitan area.

And we will continue these efforts. Because if we, as educators, do not address the educational needs of our minority youth today, by the year 2000, our work force will be in worse shape than what it is today.

It's not only the right and the just thing to do. Our economic survival depends on it.

—James Montgomery, Associate Dean, Continuing Ed. and Business Outreach

Richard F. Schubert

Former Undersecretary of Labor and
Past President of the American Red Cross

Richard F. Schubert is the immediate past president of the American Red Cross and chairman of the Commission on Workforce Quality and Labor Market Efficiency for the U.S. Department of Labor. He also has served as the U.S. undersecretary of labor. A graduate of Yale Law School, Mr. Schubert served as both president and vice chariman of Bethlehem Steel Corporation, as a visiting fellow of the Woodrow Wilson National Fellowship Foundation and as a member of the Council on Foreign Relations. He serves on the boards of many national organizations.

I'm delighted to be with you here today in this special place as an unabashed admirer of a President for whom I had the opportunity to serve for a couple of years in the '70s and, also, as a believer in community colleges. Most importantly, I'm pleased to have a chance to talk about the recommendations of the Secretary of Labor's commission's final report that was released on Labor Day 1989 and is entitled *Investing in People — The Strategy to Address America's Work Force Crisis.*

At the outset, a logical question might be why the commission chose to use the word "crisis" with reference to our work force. Our hearings, research papers and the experience of our commissioners showed, unequivocally, an increased demand for highly skilled workers and an aging work force that is beginning to create shortages of skilled workers right now — shortages that will grow for many years since the baby-boom population is already in the work force. At the same time, as you know better than I, many low-skilled workers are having increasing difficulty finding employment. In other words, we have a serious problem right now. We don't have to wait for the '90s, much less the year 2000.

The fact is that today's skill gap is likely to widen. The skill requirements of new jobs are increasing faster than the skill levels of the labor force.

Beyond that, our students are achieving at a very low level in our schools. An alarming number of kids have such poor reading and computational skills that it's impossible to give them job-specific training. This is especially acute for the 25 percent of students who leave high school before graduation. But our problem is not limited to dropouts.

For example, a recent study of 13-year-olds in the United States, Korea, Spain, United Kingdom and Canada produced these ranks for U.S. students: last in average mathematics proficiency, nearly last in average science proficiency, last in the amount of mathematics homework reported, nearly last in the amount of science homework and first only in the percent watching five or more hours of television each day — not really a very enviable leadership record. Beyond that, our best students are just average when compared with their counterparts in Europe and the Pacific Rim countries. At least 20 million, possibly 40 million of our adults, have literacy problems, and large numbers of our experienced workers already have, or soon will have, obsolete skills.

All of these points, taken together, suggest that we are beginning to experience a work force crisis that has grave implications for the country's global competiveness, for our position of influence in the family of nations, and for our individual citizen's standard of living. And so, when the question, Who should be interested in all of this? comes up. The answer is clear. All of us. Whether we are human resource specialists or not, we all have a stake.

Investing in people, in effect, responds to a warning that sounded back in 1987 by the *Workforce 2000* study conducted for the Department of Labor by the Hudson Institute. That report predicted the crisis for work force quality that would threaten the foundations of the American economy. Our report says we're there now.

Very candidly, when then-Secretary of Labor Ann McLaughlin launched the Commission on Workforce Quality in the summer of '88, my fellow commissioners and I hoped to identify two or three major initiatives that would produce immediate, broad-gage improvements in work force quality. You know, several bold, attention-getting, hopefully doable and definitive strokes. In the following year, sad to say, we came to the realization that there were no silver bullets, no simple, easy solutions.

Business has restructured almost everything it has done in the last 30 or so years. Why shouldn't schools, at least, look at it?

And with that realization, the commission's sense of alarm steadily grew. I say alarm in terms of our national security and for the well being of individual citizens and their families. While I can say with conviction that none of us believes it is too late to take corrective action, we are equally convinced that action, immediate and sustained on many fronts, is absolutely essential now. And this action requires the closest cooperation of business, labor and government at all levels.

In our view, there are three primary fronts on which the nation is going to have to wage the battle to restore the quality of its work force. Front number one is providing incentives aimed at improving student motivation and achievement. A second front is improving work force quality through public and private investments in lifetime education and training. A third front is improving the efficiency with which we utilize the skills already possessed by our work force.

The commission made 44 recommendations. Taken together, we believe they represent a coherent, comprehensive strategy for improving the quality of our work force, and they're all basic, practical, doable measures.

Now, let's take a look at each of those three fronts and the recommendations the commission has made.

■ First, incentives to improve student motivation and achievement. This is Chapter One in the commission's report and we titled it, "The Foundation of Workforce Quality," with the thought that you can't talk about work force quality very long without talking about the schools.

We decided early in our work that our concentration in this area should be on the nexus of school and work, primarily because the school system itself has been poked and pummeled by studies for the past decade and because the education system itself is not really the Department of Labor's turf — nor the commission's.

Our underlying notion in making 14 recommendations concerning education's relationship to work is that our student's don't work as hard as they need to. And as a corollary, therefore, we need to demonstrate to students that it is in their self-interest to study and learn and achieve good grades. Our recommendations include:

■ A call for the President to exert leadership in the development of firm national education goals and timetables. We're looking for *specifics* that will help assure continuing focus in the hope that this will encourage continuing, tangible results. We're encouraged by the summit which took place after we submitted our report. But from a management standpoint, we all know that unless there are clear, specific objectives with accountability measures, much in the way of good intentions can slide down the tube.

■ Further, we want to see greater involvement of the business community working with the schools, not so much regarding teaching or educating per se, but more in helping students see that working hard in school, studying the right subjects and getting good grades will pay off — both in the ability to get a job and the ability to enjoy ongoing career growth and advancement.

■ We're also calling for business to provide school administrations with information on changes in the work place. That will help the schools respond to changes in the real world in a more timely way, with appropriate changes in curriculum as well as instruction techniques. Some of us know that there's been some pretty revolutionary thinking concerning the necessity to work as teams in the work place rather than being consumed by interpersonal competition. The schools are not going to know this unless business tells them.

■ Possibly our most important recommendations related to schools and work are in our call for easily understood, portable credentials, such as transcripts, which will provide potential employers with a student's record of achievement in voluntary national achievement tests that assess student proficiency in a wide variety of academic and vocational areas. This is one of our most controversial recommendations but seems to be a clear way to get students more interested in their own well-being and productivity.

■ We also have stressed the importance of hands-on

instructional techniques that can be used to teach reading and math. Studies show students who don't succeed very well in traditional courses of conduct can benefit significantly from these more practical approaches.

■ We've also asked the Secretary of Education to review post-secondary open admission policies and their implication for student performance.

■ We desperately need to have business and academia encourage pursuit of scientific and technical courses of study, particularly by females and minorities.

■ We would like to see the employment service again operating on-site at schools to help demonstrate that those with the necessary skills will really get jobs.

■ A number of other recommendations aim at creating incentives for improving teacher competency and performance, in giving public recognition to those schools whose teachers and students display improved performance, and at encouraging experimentation in the structuring of the school system itself. The fact is that business has restructured almost everything it has done in the last 30 or so years. Why shouldn't schools, at least, look at it? The bottom line is that our companies and our communities need to be involved in finding new solutions.

I am happy to report that Secretary Dole and a business consortium group led by the National Alliance of Business has picked up many of these recommendations and are implementing them with specific task forces and action plans.

■ The second chapter of *Investing in People* is entitled, "Lifetime Education and Training."

■ The organizing principle here said the private sector must shoulder responsibility for ongoing training and retraining of workers throughout their careers while the government must provide second chance *opportunities* for those who dropped out during their trip through the school system or otherwise failed to gain the basic skills necessary to get and keep a job. Peter Drucker, in a recent conference, talking about the enormous challenge that all of us have, said, "All you really can do is to build continuous learning into yourself, your companies and your schools."

■ We made a number of recommendations aimed at encouraging the private sector to train and educate workers. These include a tax credit that compensates employers for increasing their spending on training programs. Obviously, we want to avoid windfalls for training already being done.

■ And we want to assure that only those expenses directly related to training are subsidized, in a sense, by the entire economy. But with those caveats, we believe a tax credit can offer cost-effective help in keeping the nation's work force skills current. The reality is that employers are loath to provide basic fundamental literacy and training, recognizing that when they finish the training, the employees, so enhanced, can very easily go off to another employment opportunity.

■ We've also called for restoration of the tax codes exemption of employer-provided training from personal taxation. Many of you know that a few years ago there was such an exemption. We think it needs to be restored. We think that this will eliminate a significant obstacle to an individual's willingness to receive training — the feeling that they can't afford it because it shows up on their W-2.

■ Another recommendation calls for re-examination of the anti-trust laws to eliminate any perceived legal impediments to cooperative efforts among employers to provide worker training. We think this is especially relevant to small employers who realistically will not be able, at least in their own minds, to develop the kind of curriculum and efforts that they need to ensure that they will have a flow of employees, but working together and, in fact, working with your organizations, they can do the job. And we think a by-product of that is enhancement of small firms' abilities to retain employees.

■ Finally, to further encourage private-sector initiatives, we believe the government can serve as a useful role model in providing technical assistance and information of best practices, and, we think, that's a role that the Department of Labor can uniquely fill. I believe that's something that the Secretary has immediately grasped and will indeed begin to move to provide.

Our most significant recommendation is to provide lifetime access to basic skills education for all adults.

■ Now, looking at the government's role in filling gaps that are left after the private sector has done what it can reasonably be expected to do — our most significant recommendation is to provide lifetime access to basic skills education for all adults. And this, we believe, is a very simple, straightforward, logical extension of the concept of free public education in this country, in every

state for youngsters — an elementary and secondary guarantee of education. It ratifies the idea that if an individual has not had, or not taken advantage of, the first opportunity to finish high school, that there ought to be a second chance. Now, we're not talking about very sophisticated education. Rather, we are talking about responding to functional illiteracy. When I got to this point in my presentation to the President, I said, "You know, Mr. President, we really can't afford, as a society, to pay the cost that's involved in 28 million to 40 million functional illiterates. That is an absolutely astounding burden for our society to carry, and we simply can't afford it." He nodded in assent, and then he told me a little story which I will share with you.

Apparently, in preparing for the summit, he had had some discussions with a very prominent Japanese educator. When he asked the Japanese educator what the literacy rate was in Japan, the educator responded, "Well, pursuant to your measures and standards, it's 100 percent, but in our standards it's significantly less than that."

The President said, "Well, what's your standard?"

And he said, "Our standard is the ability to program a computer, and on that basis we're only 85 percent." There is a slight difference.

■ In addition, we've asked the government to increase funding for the Job Training Partnership Act and the Job Corp because we believe that they are two of the successful elements of government programs that are particularly adjusted to the disadvantage. We endorsed the already proposed JTP amendments aimed at targeting resources to the disadvantaged who need remedial education.

■ Finally, in Chapter II, we urged the President to establish a permanent cabinet-level human resource coordinating committee. We found that there were significant overlaps and duplications between what the Department of Education does and is all about and what the Department of Labor does. We really can't afford unnecessary duplication. We've got to divert those resources to where they can be best utilized to meet this critical and developing problem.

Now, that's basically the first two chapters, all of it oriented to the quality of the work force. The next section deals more directly with labor market efficiency, or putting it another way, with the effect of utilization of the skills that are already there, already possessed by the work force. We know that 75 percent of the work force of the year 2000 are already in the work force, and so we've got to optimize those skills. One important point in reducing obstacles to labor market participation has been labeled, "Work and Family Balancing." This involves reducing the tension of family problems in the work place by helping employees to achieve faster, more effective resolution of their family concerns. The most prominent aspect of that area, of course, involves child care which currently is seen by many as the most difficult of a range of work and family problems. We recommended that federal funds, channeled to the states, be made available to strengthen the existing structure of community-based resource and referral organizations. We believe this approach helps to focus local energy on locally-identified child care priorities, attracting private-sector involvement in funding, while maximizing parental choices and flexibility.

■ We also called for a change in the current tax laws to make the existing individual tax credit for dependent care-expenses refundable to parents who are too poor to pay taxes — a refundable tax credit in other words. And we've asked that the federal government increase subsidization of the child care expenses of low income families in order to ensure their access to a higher quality of care than is currently available. All of this with a view not so much oriented to charity, which is sort of the orientation of the Red Cross and my responsibilities there, but enlightened self-interest of the whole economy. We simply have to have more warm bodies to do the jobs that need to be done.

■ And to help employers understand the effects of programs on their bottom line — programs of the type to which I've just alluded — we asked that government support research on what works best and then share that in the employer community.

■ Another aspect of putting quality to work is the matching of workers with jobs. In this area, we recommended the use of performance standards to measure the work of employment service agencies around the country to assure that the employment services are targeting on the right objectives. We can't afford them to be covering a waterfront of objectives given the crises that we are currently developing.

■ We called for increased experience rating in the unemployment insurance system to insure that the system doesn't subsidize firms who resort to layoffs at the expense of those who do not.

■ Finally, in the area of matching workers and jobs, we believe the ongoing adjustment of immigration pol-

icy should assure, or at least attempt to assure, a balance between upgrading the skills of American citizens for job opportunities and admitting larger numbers of foreign workers. Of course while we make the system responsive to labor market needs, we do have to keep our other eye on the humanitarian objectives of our policy. What we rejected, however, was the notion that immigration policy should be the valve that we turn on to meet work force skill needs. That's morally wrong, in our view, because of the inner-city needs that we have — finding jobs for people who are our own social responsibility.

■ In one final area regarding utilization of our available skills, we focused on worker participation. Here again, we recommended that the government assist by conducting studies and disseminating information, especially best practices with regard to worker participation, innovative compensation models and portability features, all of which are oriented to helping employees do the job in helping people fit into the stream of work flow.

Improving work force quality will require new public expenditure, not just at the federal level — in fact, it's more compelling at the state and local level — as well as significant expenditures from private sector sources.

Chapter IV of the commission report, stemmed from our frustration that, more often than not, we couldn't really get our hands on the kind of data that we thought we needed to answer some critical questions, questions that were served up in our commission's charter. The fact is that since the mid-1970s we have significantly reduced funding for research and data, and now we simply don't have the data to help answer the questions that decision-makers are forced to answer, and so they answer them without data. We believe that we've got to step back and reassert some prioritization in respect to funding, research and evaluation.

That's a snapshot. Probably more than you ever thought you wanted to know about a subject that I would suggest to you is terribly important to every one of us regardless of what our vocational pursuit is. Because all of us have a stake.

I want to focus for just a moment on that question, Who is responsible now for picking all of this up? Well, the fact is our commission went out of existence at the time that we gave the report to the Secretary of Labor so we entrusted all of our "wisdom" to government decision-makers and decision-makers and leaders around the country, who we hope will be challenged with the necessity of stepping up to the plate in some of these areas. We believe, as I said earlier, that there is an absolute, indispensable need for close cooperation between business, organized labor and government at every level. Then, we have to look inward at ourselves and appraise what we can do as individuals to move this ball along.

Now, there is one final logical last question, and that is, What about the deficit? What you've been talking about will cost some money. Won't these recommendations cost billions of dollars that have not yet been appropriated? Is all this realistic? We looked hard at that issue. We were sensitive to the budget issue and the deficit problem. We were well aware of all of the other urgent priorities. In the end, we had two choices — are we going to be budget neutral, or are we going to respond to the sense of urgency that we believe our data supports? And so, fully aware of how far short the administration, the economy — all of us — are in the resources that are necessary, we reached this conclusion: Improving work force quality will require new public expenditure, not just at the federal level — in fact, it's probably more compelling at the state and local level — as well as significant expenditures from private sector sources. But the good news is that wisely chosen investments in human capital will yield substantial beneficial results. And the other news is, there really isn't any alternative. There simply is no way that we are going to stay competitive in this world arena without investing significantly in human resources.

We believe that we are at a crossroads. If we intend to maintain our standard of living and want to remain a strong player in the global marketplace, then we have to change our fundamental approach in the way we educate, train and retrain our workers, and it's got to be a lifetime exposure and experience and commitment. We are still an extremely wealthy nation, but we are at risk for want of human resources. We simply cannot accept a work force that is undereducated, undertrained and ill-equipped to compete in the 21st century. That's why we suggest that this is one of those issues that has to be at the top of our national agenda. We are really not rational people if we put it anywhere else.

The Gerald R. Ford Museu

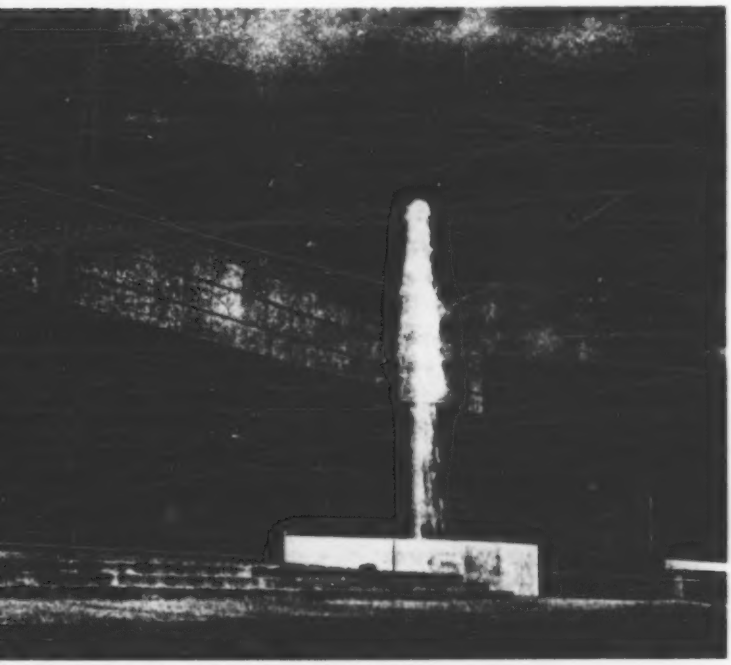
The Gerald R. Ford Museum, located in Grand Rapids, Michig
of our 38th President, including a full-scale reproduction of the
Visitors to the Museum will find a wealth of information on Ge
Various exhibits, many with sound and film, feature the co
presidential campaign, the pardon of Richard Nixon, and rel
photographs of Gerald Ford and his family also offer the visitor
Visitors can see gifts presented by Heads of State and foreig
Ford from the American people. An award-winning film, "Gerald
hour in the Museum's auditorium. The Museum also offers feature
its permanent displays. The Museum was dedicated in 1981 to the
to enjoy, to learn, and to participate in our great national heritage
The research collections relating to Gerald Ford's public life a
of the University of Michigan, Ann Arbor.
A nine-foot space goliath, "Man in Space," was created by sc
leaving a space ship, was carved by hand by Nelson alone and ca
The $7.2 million museum was designed by Marvin DeWinter
44,000 square feet. The exhibits and display items were desig
Washington, D.C.
Dr. Frank H. Mackaman is director of the Ford Library and M
Records Administration.

Museum

and Rapids, Michigan, houses exhibits that chronicle the life and times
production of the Oval Office.
f information on Gerald Ford's life and his dedication to public service.
film, feature the congressional years, his vice-presidency, the 1976
rd Nixon, and related national and international issues. Candid
so offer the visitor a view of the man at informal moments.
of State and foreign dignitaries, as well as personal gifts to President
ning film, "Gerald R. Ford: The Presidency Restored," is shown every
n also offers feature exhibits of historical and social interest to enhance
cated in 1981 to the American people as a place where all are welcome
at national heritage.
Ford's public life are housed at the Ford Library on the North Campus

" was created by sculptor Judson Nelson. The sculpture, an astronaut
Nelson alone and can be seen on the Ford Presidential Museum plaza.
y Marvin DeWinter Associates of Grand Rapids and is approximately
y items were designed and selected by Staples & Charles, Ltd. of

Ford Library and Museum, which is part of the National Archives and



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